

ERYSIPELAS

its

SYMPTOMS, PATHOLOGY and TREATMENT.

A Historical Study.

A Thesis submitted for the degree

of

DOCTOR of MEDICINE

by

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When the inflammation goes deeper than the skin, into the cellular membrane, it often suppurates ; but then I suspect it is not the true erysipelatous.

John Hunter.

PREFACE

In spite of the fact that a disease known as Erysipelas is mentioned in the writings of Hippocrates, and that therefore the name has had its place in medical literature for a period as long as our records extend, there is perhaps no term which in times past has been so loosely employed or about which even at the present day there exists such a lack of precision.

On being appointed special clerk in charge of the Isolation wards of the Royal Infirmary for the year 1892 -93, certain differences were observed between the symptoms occurring in the cases of erysipelas under treatment, and the descriptions given in several of the more frequently consulted text books. On investigating the subject somewhat more closely, considerable discrepancies were found among the various authorities, the advantage in point of description lying rather with the older works. I was thus led to investigate the history of medical opinion regarding this disease chiefly from a clinical standpoint.

Such a history as Hirsch has said "affords a sort of picture of the development of scientific medicine" remarkable perhaps in this case for the fact that the influence of authority for so long usurped the place of observation, as to bring the chief period of advance well within the present century.

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I have after certain preliminary considerations proceeded to describe the clinical features of the principal varieties of the disease, basing my statements on those of recognized authorities and supplementing them on some points from personal observation.

A short sketch of the history of the subject is then given, and as it would serve no useful purpose to minutely chronicle the various conflicting doctrines advanced from time to time, I have endeavoured rather to indicate the main lines of thought on the subject than to multiply references or quotations.

Under the heading of Aetiology I ^{have} discussed the conditions under which the disease prevails, both in the patient and his surroundings. The nature of the specific organism and the pathology of the disease have also been discussed.

Treatment has been briefly sketched on historical lines, and the more recent methods have then been examined in greater detail, especially those of which I have had personal experience.

I have devoted a section to the relation of erysipelas to other diseases, in which I adversely criticized the opinion as to the alleged causal relationship to such diseases as Puerperal fever, and have examined the evidence as to the favourable influence erysipelas is stated to produce in certain

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malignant and tubercular diseases.

The main conclusions and inferences arrived at have then been stated, along with such suggestions as a critical digest of the subject has enabled me to put forward.

Finally a copious bibliography has been appended, which while making no pretensions to be a complete index to the literature of the subject, or indeed of those books which I have consulted, includes the name of every author quoted, and the place where the chief exposition of his views may be found.

CHAPTER I.

DERIVATION and CLASSIFICATION.

Although the word $\epsilon\epsilon\upsilon\sigma\acute{\iota}\pi\epsilon\lambda\alpha\varsigma$ occurs in classical Greek its derivation is by no means certain and has been variously given by different authors. That which has received most support is from $\epsilon\epsilon\upsilon\omega$ I draw $\pi\epsilon\lambda\alpha\varsigma$ -near in allusion to the tendency of the disease to invade adjoining parts. It has also been rendered from $\epsilon\epsilon\upsilon\theta\epsilon\omicron\varsigma$ -red which with $\pi\epsilon\lambda\alpha\varsigma$ might mean "redness near a wound" or with $\pi\epsilon\lambda\lambda\alpha$ -skin would give the equivalent of the popular term Rose by which it has long been known both in Scotland and Germany many while combined with $\pi\epsilon\lambda\acute{o}\varsigma$ -dusky and livid might refer to the "dusky redness" which is a well recognized description of the most striking local symptom. None of these derivations however are altogether easy to reconcile with the fact, that at a very early period, the name was applied to an inflammatory condition of the internal organs, such as the lungs or uterus, in addition to a disease of the superficial parts with which we now associate it.

Even with reference to the latter Hippocrates^{43.*} applies the same name, to cases in which resolution took place and also to those in which extensive sloughing and gangrene resulted.

* This & the succeeding numbers refer to corresponding numbers in the Bibliography

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In this respect he has been followed by the majority of authors, and though from time to time the desirability of separating from one another the various processes classed as Erysipelas has been pointed out, it has never been carried into effect in this country.

It seems desirable therefore at this stage to adopt a definition sufficiently extensive to cover the wider application of the term at the present time, and subsequently to examine the claims of the more important "varieties" of the disease to be regarded as parts of a single morbid process or as separate pathological entities.

Hirsch⁴⁴ has defined erysipelas as "an infective inflammation of the skin or one of the mucous membranes near to the external surface of the body (mouth, throat, vagina, etc) which in all probability proceeds invariably from a solution of continuity or wound, and is characterized by its rapid extension over the surface, and by the infective fever that accompanies the local process; the latter in many cases confined to the skin and in such cases mostly heals rapidly leaving no permanent effects : but in other cases to the subcutaneous (or sub-mucous) tissues; sometimes even to still more deeply situated parts (phlegmonous erysipelas) and leads to a more or less considerable suppuration spreading along the surface , or to gangrenous destruction of parts (malignant or gangrenous erysipelas), under certain circumstances

even to secondary affections of other (internal) tissues or organs. "

In considering the history of this affection a more serious difficulty even than the scope of the whole term is to be found in the numerous classifications which have been put forward. Not only have synonyms been multiplied but some of the expressions most frequently used are by no means synonymous as used by different authors.

The classification adopted is that of Nunnely⁷², which has the merit of simplicity, and clinical usefulness, while it also well represents the most developed views of the older British surgeons as to the nature of erysipelas, and is that usually adopted in English text books of Surgery.

This classification was founded on an anatomical basis, and external erysipelas was divided into three principal varieties (for in his opinion they merged into one another) as follows. (1) Cutaneous. (2) Cellulo-cutaneous. (3) Cellular, according as the chief seat of the disease was in the skin, the skin and cellular tissue or the deeper cellular tissue respectively. The first of these classes included Erythema which in addition to the affections at present known by that name was applied (to a varying extent) to the milder cases of cutaneous erysipelas, while Erysipelas was used as a generic title or more particularly applied to the severe forms. The main

features of these forms I shall now describe, and along with them those of such minor forms of importance under their appropriate headings.

Chapter II.

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THE CLINICAL CHARACTER OF ERYSIPELAS.

(1) CUTANEOUS ERYSIPELAS (synonyms : E. Simplex (Lawrence)²⁵ E. Superficiale (James)²⁶ Erysipèle légitime.) The incubation period of this affection has been very variously estimated , indeed until the contagious character of the disease was fully admitted it did not present itself as a question requiring an answer, and on purely clinical grounds little has yet been done towards its solution. Watson²⁷ has mentioned two cases where the disease appeared seven days after exposure to contagion, while in a third case only five days elapsed. Murchison²⁸ gives it as ranging from one to three or four days. It is probable that the most accurate data we possess on this point are the results of cases where Erysipelas has been inoculated on man for therapeutic reasons. In such a series of six successful inoculations Fehleisen²⁹ found the interval between the insertion of the culture and the initial rigor varied from 15-61 hours, the average time being 32 1/2 hours.

Though it has been noted by several observers that patients have complained of feeling drowsy or chilly for several days before an attack, the actual invasion of erysipelas is usually sudden and accompanied by well marked symptoms.

In addition to malaise and headache there is generally one or more well marked rigors, accompanied by nausea and frequently by more or less severe vomiting of bile stained material. Convulsions in children, and even in adults, (Woodman⁷⁷) have been recorded, and severe epistaxis is stated to be not uncommon (Beck⁵). During this period there is a rapid rise of temperature to 103°F. or higher. These symptoms are followed by swelling of the lymphatic glands in the neighbourhood of the part about to be attacked. The patient may also complain of sore throat, a point to which more detailed reference will afterwards be made.

A somewhat indefinite interval elapses between the occurrence of these invasion symptoms and the appearance of the local redness, which forms the most characteristic feature of the disease. It may occur almost simultaneously with the initial rigor or be delayed as late as the fourth or fifth day (Nunnely⁷²) but probably the time which elapses is rarely more than twenty four hours and usually much less. That the affection is only latent at this period is supported by cases in which the disease has apparently been communicated by vaccination with lymph taken from a child in whom erysipelas developed on the following day.

This form of erysipelas has its most common seat and runs its most typical course on the face and head, indeed its frequent occurrence in this re-

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gion led many of the older authors to regard it as a separate affection to which the names idiopathic or medical erysipelas were given as distinct from the surgical or traumatic forms, which though also occurring on the head were more particularly associated with some obvious wound. It has however been shown by Trousseau⁸⁹ and others that a breach of surface may often be found to be the starting point of an attack of erysipelas, if sought for at a sufficiently early period, and that there is reason to suspect its presence in all cases though it may be readily passed over undetected owing to its trivial character, or be hidden by the swelling which takes place.

After the symptoms above mentioned, an itching tingling sensation is perceived often at a junction of skin and mucous membrane such as edge of the nostril, angle of the eye or corner of the mouth. The patient complains of the part feeling stiff and slightly swollen, and this sensation is quickly followed by the appearance of a small irregular patch of redness.

This patch has the following characters :-
The colour is a deep vivid rose or scarlet fading on pressure to a yellowish white, and rapidly returning when the pressure is removed. The part also feels hot to the touch is more resistant than natural, it pits slightly, and the pressure is distinctly painful. The cutis is slightly swollen giving the surface a glazed shining appearance, and the advancing margin

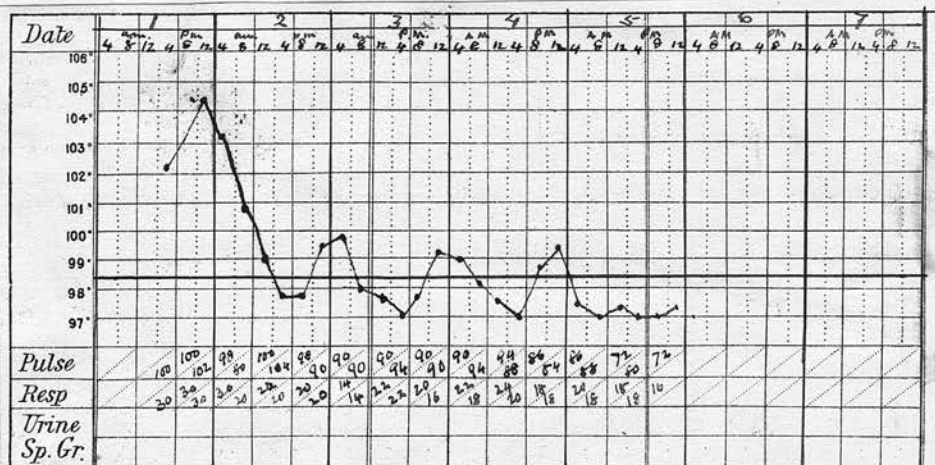
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is slightly but distinctly raised above the surrounding skin this being easily perceptible both to the eye and to the finger.

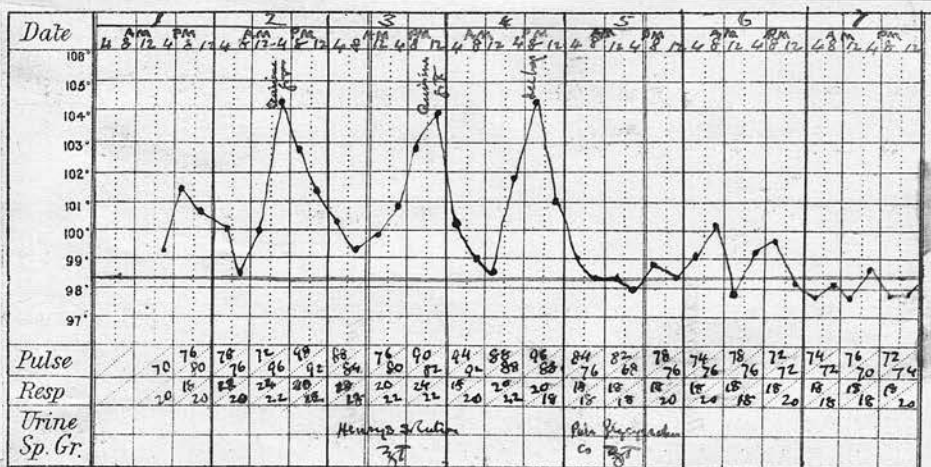
Beyond the red area a zone may be defined which is tender on pressure, though not discoloured, extending about an inch in advance of the margin of the redness (Zuelzer¹²⁰). In certain directions also notably in the line of the lymphatics irregular projections may be felt which are also tender to touch.

The area of redness continues to spread irregularly with greater or less rapidity. Its advance is often not continuous, and when it starts near the middle line its distribution is often symmetrical even when the outline is extremely irregular. When its advance is very rapid or when the exudation is profuse small vesicles form on the surface, or a few large bullae, but these are by no means a constant feature of the disease. They contain clear, or it may be slightly blood-stained serum, and burst and dry into scabs without ulceration.

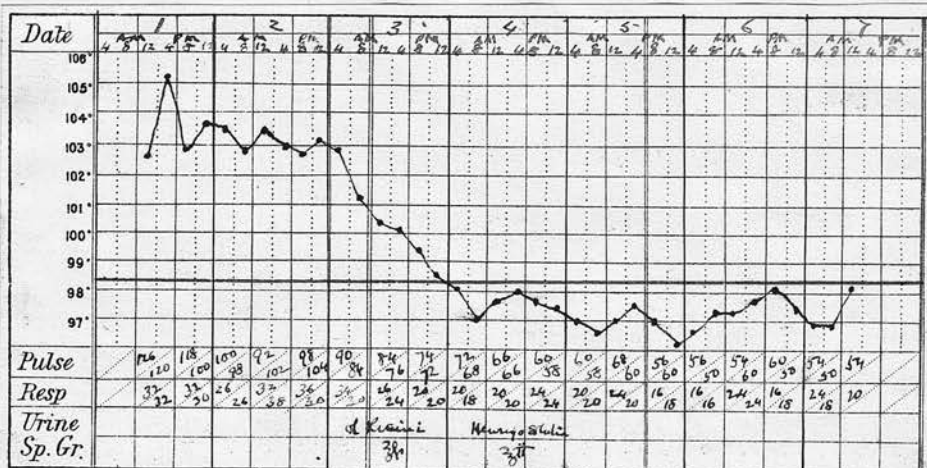
By the third or fourth day from the initial rigor the parts become greatly swollen, especially the loose tissue of the eye-lids etc, where the swelling becomes so great that the eye cannot be opened and the features may be remarkably distorted. Watson⁷² says "I know of no disease except perhaps the confluent small pox which so completely and speedily deforms and disguises the visage of the patient". About the fourth or fifth day the



Male aet-25 Erysipelas of face



Female aet-24 Erysipelas of face



Male aet-21 Erysipelas of face

Charts showing three types of temperature in uncomplicated Erysipelas of the face
from cases in Deschamps' words

redness begins to fade at least at its original site but the patch may fade at one margin and continue to advance at the other thus presenting all stages at one time.

The course of resolution in a part or the whole of the area is the same. The redness ceases to extend, the margin loses its defined and raised character and tends to fade into the surrounding skin, the tenderness and swelling become less and the outer "zone of tenderness" is ill defined. The redness finally gives way to a yellowish colour and the epidermis desquamates in large flakes, and the hair is not infrequently shed.

Along with these local changes there are general febrile symptoms often of great severity and of the most depressing type.

The temperature usually continues to rise after the redness appears and attains a height of 104°- 105° F. while as high as 107° 6 has been recorded (Wunderlich)⁷⁸. Some observers have noted a marked remission on the appearance of the local symptoms but this does not appear to be of frequent occurrence. The course of the temperature is intimately associated with extension of the local change in the skin. When the latter spreads rapidly and continuously, the fever is of a continuous character, while in other cases remissions occur during which the local lesion is less active, and exacerbations of temperature coincide with the implication of fresh areas of

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skin surface. The pulse is rapid ranging from 100-to 120 per minute according to the temperature. It is soft and often decrotic with a tendency towards intermission in severe cases. The patient is restless and sleepless, and the sleep is much disturbed. A certain amount of muttering delirium is usual, especially if the face or scalp is involved, and occasionally this is replaced by a more furious type, in which the patient is violent and noisy requiring restraint to keep him in bed. Headache is almost a constant symptom, and is often very severe in character. The disturbances of the alimentary system have been less dwelt upon by modern observers than by the older writers, less indeed than their importance seems to warrant. They are frequently very pronounced and constitute no inconsiderable part of the disease in relation to treatment.

The tongue is foul, brown and dry due in great part to respiration being performed through the mouth. There is a bitter unpleasant taste in the mouth, with great thirst and almost complete anorexia. Great nausea and epigastric pain are not infrequent and the initial vomiting often continues in a severe form, the stomach rejecting nourishment soon after its administration, or spontaneously ejects quantities of mucous and watery bile-stained fluid.

In opposition to some modern authorities - who mention vomiting as only an occasional if not an unusual symptom Syme⁸⁴ says:- "It" (erythema which is by him applied to simple erysipelas) "is preceded

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and accompanied by great constitutional disturbance ushered in with prolonged rigors ,sickness and retching which is sometimes almost incessant for several days together". The cases I have observed seem to support this statement. The liver is said to be generally enlarged and tender and swelling of the spleen disappearing on the fading of the redness has also been observed. (Friedreich)

The bowels are usually confined though there is occasionally diarrhoea , the motions in either case being dark in colour and very offensive . Cases of duodenal ulcer which have given rise to fatal haemorrhage have been recorded by several observers but are not of frequent occurrence.

The urine as one would expect from the high temperature is highly coloured , concentrated and shews a thick deposit of urates.

Albumin is frequently found during the height of the disease and its presence is said to be sometimes persistent. (Lebert). I have never seen it in any large quantity but the majority of cases show traces. Bile, blood, and casts are of less frequent occurrence but the first of these I have observed on several occasions.

The termination of the attack is accompanied by a sudden rapid fall of temperature, which generally remains below the normal line for a few days. As a rule in healthy subjects convalescence is rapid but in debilitated persons or cases of long duration the

crisis may be attended by dangerous prostration. As to the average duration of an attack of erysipelas there is considerable diversity of opinion among writers on the subject. This is what one would naturally expect in dealing with a disease in which the duration of the fever depends on the extent of the local affection, which we have seen is subject to great variation. Some of the discrepancies in this respect may also be due to the omission by most authors of any statement as to the point from which this period is measured i.e. - whether from occurrence of the invasion- symptoms or the actual appearance of the area of redness.

As a specimen of the periods given there may be cited :- Billroth² 2-10 days rarely a fortnight
 Volkmann^{91.} 6-8 days; ^{Grave³⁷ 5 days} Bartholow^{3.} 1-3 weeks or longer
 Zuelzer¹⁰⁰ 6-14 days ; Nunneley^{71.} 10-12 days ; Velpeau¹² 12 days ; Anders⁶ 14 days ; Erichsen^{29.} 3 days -3 weeks.
 There is therefore a considerable consensus of opinion that the affection lasts about a fortnight and it is probable that the complete exclusion of cases not of a purely cutaneous type might still further reduce this period.

In the Isolation wards during my tenure of office there, the period from admission till the critical fall of temperature and cessation of the spread of the disease averaged 4.7 days for a total of 30 uncomplicated cases of cutaneous erysipelas.

A similar average duration (under five days) was observed over a considerably larger series of cases in the previous year. It is worthy of note that this period of five days is not only the average, but also that most frequently observed, while cases lasting longer were not common, only four of the thirty having a duration of ten days or longer the longest period observed being 15 days.

The interval which elapsed in these cases before their admission to the Isolation ward was probably a somewhat variable one but it may be assumed that the patients were removed from the general wards as soon as the appearance of the local symptoms made the nature of the disease evident. Therefore allowing an average interval of twenty-four hours for invasion and perhaps a similar one for incubation the duration of the disease till deferescence may be stated at 7 or 8 days while desquamation is completed in perhaps an additional three days. The prognosis of an attack of this form of erysipelas is not unfavourable if the patient be under middle life and otherwise healthy. Anders has stated that for 1674 cases the average mortality was 6.5 per cent, while taking only those occurring in private practice it was 4.16 per cent, and a further reduction to 3.5 per cent was affected by excluding persons over forty years of age. In persons above the age of seventy he states that the mortality was 46 per cent.

The chief causes of death are those incident to other acute diseases of this character, and death from asthenia is perhaps most to be dreaded while complications such as pneumonia, neph^ritis, or delirium tremens account for a large proportion of deaths during erysipelas.

With regard to the sequelae the most important is the occasional occurrence of blindness, from atrophy of the optic nerve in one or both eyes, and usually complete loss of vision in the affected organ. It usually occurs during the attack but occasionally follows it after a period during which vision seems unimpaired. A not unfrequent occurrence is the formation of small well defined abscesses, often in the eyelids or loose skin under the eye, or at other points over which the affection has extended. Their importance lies in their presence in the course of a form of erysipelas in which suppuration (with this exception) does not take place, and they have therefore been regarded as connecting this affection with that known as phlegmonous erysipelas, while on the other hand those who look upon these as distinct affections, regard them as accidental complications. They are usually trifling and heal readily. Unlike some other diseases such as the specific fevers, erysipelas does not confer immunity from subsequent attacks but rather gives rise to a predisposition to them.

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Such subsequent attacks may take place several times in the course of a life-time at irregular intervals, but in some patients the predisposition is such that a certain regularity of recurrence has been established. The subjects of this "habitual erysipelas" as it has been termed may have an attack once or twice a year, with a considerable regularity as to season though varying greatly in severity, while in some cases the intervals are much shorter.

In women attacks have been known to accompany the menstrual period with unfailing regularity for a year or more. A case has recently been recorded by Critzman¹¹ in which a woman had suffered from facial erysipelas nearly every month for five years.

The name oedematous erysipelas has been applied somewhat loosely to two different conditions :- Erysipelas occurring in a part already the seat of oedema and to cases of erysipelas accompanied by an unusual amount of oedematous exudation.

The former of these calls for no special comment and the title is more correctly confined to the latter. This form of the affection is most frequent where the laxity of the tissue permits free effusion as about the scrotum, though it may also occur on the limbs or face.

The affected part is red and swollen to a variable extent but pits freely on pressure. The surface may be smooth and glossy or covered by

numerous vesicles but there is much less pain, heat and tenderness than in the more typical cutaneous form of the disease.

The general symptoms also seem to be much less severe. In a case of this description under my care in the Isolation wards the disease started from an irritated "pimple" at the bend of the elbow and thence spread in opposite directions to the wrist and shoulder, chiefly on the anterior aspect of the limb, though in the fore arm over the whole circumference, which measured two inches more than on the sound side. The surface was closely studded with vesicles about the size of a split pea, accompanied by several large bullae. The parts gave a "boggy" semi-fluctuating sensation to the finger and a small puncture (with Graafe's knife) through the skin of the forearm gave exit to a quantity of straw coloured serous fluid, which continued to drain away for two days, so freely as to repeatedly saturate the wool in which the limb was enveloped. In this case the general symptoms were entirely absent the temperature never exceeded 99°.8F. (See chart.)

The disease terminated in the usual manner by the drying up of the vesicles and desquamation of the cuticle about the sixth day. The patient stated that during a former attack of erysipelas of the face there was great swelling and a serous discharge from skin.

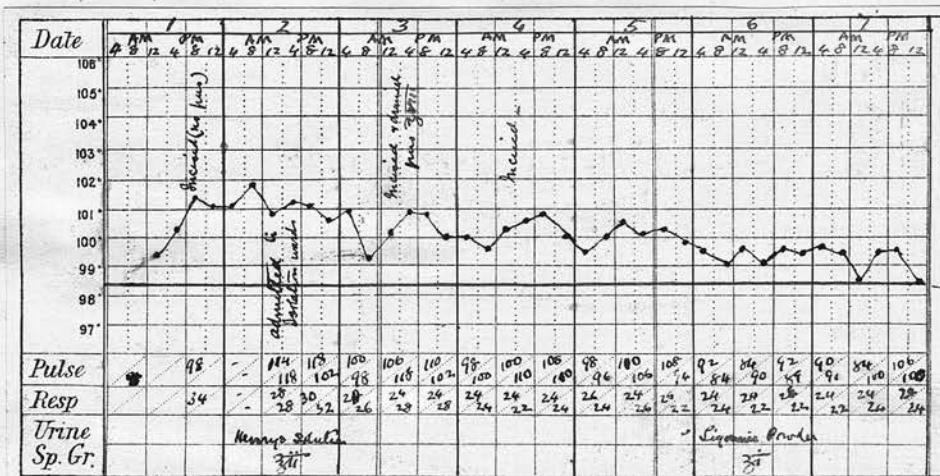
This variety of erysipelas has been stated to occasionally terminate in suppuration and gangrene possibly the effect of septic infection of punctures employed in its treatment. It has been asserted to be a transition form between cutaneous and phlegmonous erysipelas but it probably has no connection with the latter.

(2) CELLULO CUTANEOUS ERYSIPELAS (Nunneley⁷¹)
synonyms Phlegmonous erysipelas. Diffuse phlegmon
Dupuytren²⁶. Pseudo-erysipelas. Rust.⁸⁰

This affection varies considerably in severity and the descriptions given by different authors do not entirely agree with one another. It is prone to affect wounds but is also stated to occur in an epidemic form without breach of surface (Copeland¹⁹).

Its onset is sudden and accompanied by one or more rigors which may be so numerous as to simulate intermittent fever (Dupuytren²⁶).

The local appearances at first simulate those of simple erysipelas. There is an area of redness which however is usually from the first of a darker hue, less sharply defined at its margins, and less uniform in its colouration, than that formerly described. The swelling of the affected part is also greater, and for the first few days it pits readily on pressure, the redness at the same time



Portion of Chart in a case of cellulitis of leg & thigh
(Cellulo cutaneous Erysipelas of Munneley)

fading for an instant. At the end of about five days the swelling undergoes considerable increase and the part assumes a brawny hardness, the colour deepens to a livid mottling and vesicles containing a sero-purulent fluid appear. The pain, at first burning, may now assume a more throbbing character. Following this, without much change to the eye, important alterations take place in the character of the swelling. The brawny feeling gives way to an obscure sense of fluctuation or "bogginess", which indicates the breaking down of the subcutaneous cellular tissue which is characteristic of this affection. This suppurative process undermines the skin with great rapidity over a large area, and instead of tending to "point" like an abscess it (if untreated) interferes with the vitality of a greater or less area of skin which dies, giving exit to extensive sloughs of cellular tissue and large quantities of thin purulent fluid. The suppuration is usually limited by the fascia but may extend to the inter-muscular planes.

The constitutional symptoms are those of extreme fever, rapidly giving way to exhaustion on the occurrence of suppuration, the patient tending to sink from asthenia. When sloughing is established septicaemia or pyaemia is apt to ensue.

The course of the pulse & temperature is a ~~few~~ typical case of this description which ~~was~~ was under my charge in the Isolation wards is shown in the annexed chart.

(3) CELLULAR ERYSIPELAS. Diffuse Inflammation of the cellular tissue (Duncan,²⁴ Earle²⁷). Erythema Anatomicum (Good³⁶).

This affection is very closely related to that last described, indeed Nunneley⁷² confesses that the distinction is ~~an~~ artificial one and that while some writers would class all such cases as phlegmonous erysipelas, and others as diffuse inflammation of the "cellular membrane", a third party while admitting a difference between these affections would have difficulty in deciding to which of them certain cases should be referred.

In accordance with the anatomical basis of Nunneley's classification the difference lies in this disease affecting the subcutaneous cellular tissue without involving the skin except in a secondary manner. Clinically it is distinguished as being a much more severe affection, as under this title are included the long series of fatal dissection wounds which formerly furnished such a heavy item in the death roll of the medical profession.

Though it was probably well known as the most serious and unfortunate sequel of venesection and ~~ascribed~~ to inflammation of the vein or to the injury of a nerve, tendon, or fascia, by the lancet, it was first accurately described by Andrew Duncan²⁴ jun. in a valuable paper containing histories of 34 cases nearly all of which he had personally observed.

Several cases are mentioned (Duncan)²⁴ where the cause was unknown, or it was attributed to causes which did not involve a breach of surface, but the connection of this affection with the presence of a wound (often a minute one) is as a rule more evident than that of the other forms.

Of Duncan's series of 34 cases no less than 13 arose from dissection wounds, while 6 followed venesection, while other slighter cases from these causes are mentioned. The local symptoms most frequently precede the constitutional ones, in the form of some irritation about the point of inoculation but this is so slight in many cases as to be readily overlooked. In cases arising from venesection inflammatory action seems to have begun simultaneously with the constitutional symptoms about the third day, and spread from the wound as a centre, chiefly towards the trunk but also in a contrary direction.

In the case of dissection wounds and snake bites (which were also included in this category) the course was different. The seat of inoculation remained unaffected or at most marked by the formation of a small pustule, which Colles¹⁷ was inclined to regard as having a specific character. An incubation period followed varying from 12 hours to about a week but usually not more than 2 days (Duncan)²⁴ when the constitutional symptoms commenced and concurrently with them the destructive local changes.

These however exerted their influence, not on the parts surrounding the wound, but at a distance, especially about the axilla and subcutaneous tissue of the trunk in the case of wounds of the hand, the fore arm and arm being rarely affected or even presenting traces of morbid action in connection with the wound (Duncan²⁴).

The swelling in the axilla is characteristic, being diffuse and but slightly elevated, with no tendency to "point" while giving to the finger that obscure sense of fluctuation described as "boggy" by Lizars, or "doughy" by Colles⁷. The glands are but slightly affected (Duncan²⁴). The affected part is exquisitely painful on account of the rapid effusion into the subcutaneous tissue. Redness does not appear to be constant and is always secondary (Duncan²⁴) but according to Nunneley⁷² though "not so conspicuous as in the preceding variety (phlegmonous erysipelas) it is however never altogether wanting; in all cases at one period or another the skin participates in the disease, sometimes very extensively."

Bullae have been observed in some cases (Colles⁷, Nunneley⁷²) but did not occur in Duncan's²⁴ cases. They are certainly admitted to be less frequent than in the other varieties. At a later period vesicles or phlyctenae occur, preceding the sloughing of the skin which takes place as in phlegmonous erysipelas. The changes disclosed are also similar in

kind but more extensive, the suppuration more often extending beneath the fascia and spreading in the intermuscular planes leading to the utter disorganization of the muscles, opening into the joints or even attacking the periosteum. The constitutional symptoms also resemble those of phlegmonous erysipelas but "exhibit more of the adynamic type"(Nunneley)⁷².

They vary considerably in different cases according to the extent of the local lesion and the nature of the poison absorbed.

The patients are described by Duncan as lying in a supine posture, rarely moving on account of the pain involved, the respirations being shallow for the same reason. The fever usually begins with rigors and soon attains its maximum. Nausea, vomiting and hiccough are also observed in some cases, and Duncan²⁴ mentions the absence of coma and the rare occurrence of continued delirium in the cases seen by him. A peculiar symptom mentioned in several cases is the presence of an offensive cadaverous odour, emitted by patients during life, apparently from the cutaneous perspiration.

(4) ERYSIPELAS of INTERNAL PARTS

In addition to the varieties above described erysipelas has been stated to attack internal parts especially the serous and mucous membranes also the veins and lymphatics . Nunneley⁷² (for reasons which will be referred to later) included certain affections of these structures under the term erysipelas.

The diffuse peritonitis, which in the pre-antiseptic era usually followed surgical or accidental wounds of the abdomen, came under this description, as did also that following delivery then as now known as puerperal fever. The relations of erysipelas to inflammation of the serous membranes will therefore be discussed under puerperal fever with which an intimate connection is alleged to exist.

Phlebitis was doubtless a frequent local complication of cellulitis when due to venesection and probably in a more wide spread form as a sequel both of the cellululo-cutaneous or cellular varieties.

Such inflammations however would not now be described as erysipelas.

The possibility of the erysipelatos process affecting mucous membrane seems to rest on better authenticated evidence and a short resumé of its history in this connection is of interest.

Among the facts in connection with erysipelas

mentioned by Hippocrates^{42.} reference is made to many of the patients being attacked with sore throat, and since that time the connection between affections of the throat and erysipelas has been from time to time referred to by medical authors. Till the eighteenth century the affection of the throat is frequently mentioned as a metastasis, to be guarded against by avoiding repellent remedies to the skin but does not appear to have been accurately described.

At the beginning of the present century erysipelas of the throat seems almost to have been forgotten (Cornil)²⁰ when in France attention was directed to it by Gubler who published a case of facial erysipelas which proved fatal by oedema of the glottis.

In the years 1821- 24 we have the record by Drs. Stevenson²³ and Gibson^{34.} of an epidemic of erysipelas in Montrose, during which, in addition to strong evidence of its contagious character, a large proportion of the patients exhibited throat symptoms, either occurring along with erysipelas or apparently acting in substitution for it. The erysipelas appears to have been frequently of phlegmonous character and the throat symptoms which were severe, sometimes preceded, sometimes followed the affection of the superficial parts. The disease was of a more fatal type than usual as Gibson states that

the mortality in cases seen by him was 15 per cent while he had no deaths in 100 cases of simple erysipelas.

Many other cases of a similar character have been recorded about this date, in some of which the pharynx and fauces are stated to be simply reddened while in others superficial ulcers, membranes, "apthous patches" or stomatitis are described, all usually in connection with erysipelas of the face.

Attention having been directed to the occurrence of erysipelas affecting the mucous membranes, cases are forthcoming in profusion, for at least some of which a different explanation might now be given. Thus in the British and Foreign Medico -
Chirurgical Review¹⁸³⁵ for 1835 we have cases recorded where erysipelas extended to the bronchioles, a case of erysipelas of the throat followed by gastro-enteritis and the appearance of erysipelas on the nates of which the writer (whose name is not given) says "this case excited much interest at the time. It appeared to be an instance of erysipelas extending throughout the whole length of the intestinal tube". A third case in which erysipelas spreading from the groin attacked the vagina and uterus and bladder and caused death by purulent peritonitis is also recorded.

Porter⁷⁸ has recorded a case in which a woman was admitted to hospital and contracted erysipelas

from a patient in the adjoining bed. The disease first appeared about the eye and then attacked the pharynx from whence it spread to the larynx and caused death from oedema of that organ on the third day after its appearance on the face.

It is not till the middle of the present century that cases are described with sufficient detail to shew that the erysipelatous process spreads here as elsewhere by continuity of tissue.

Gull³⁸ has recorded cases in which erysipelas affecting the fauces has spread to the face by way of the nostrils, by the nasal duct and by the external auditory meatus, as well as a case where it spread from the fauces to the larynx. He also mentions cases of sore throat associated with erysipelas in other parts of the body and instances of stomatitis and glossitis apparently of erysipelatous character. Cornil²⁰ in a valuable paper gives the history of several cases in which the disease spread from the pharynx to the face by way of the nostrils, nasal duct, and middle ear and a case in which it spread from the face through the mouth to the pharynx.

The throat symptoms in these cases were marked by redness and swelling of the fauces, soft palate, tonsils, and pharynx, but vesicles and membranous shreds are also mentioned.

Trousseau⁸⁷ lays great stress on the importance and frequency of erysipelatous pharyngitis,

and states that he was able to predict an attack of erysipelas of the face by the appearances of the patient's throat, the disease extending through the nostrils which seems the most frequent route.

Morell Mackenzie⁶⁰ states that he had only seen four cases of erysipelas of the pharynx, in three of which the progress was from the pharynx to the face, twice by way of the nose, and once by the mouth. In the fourth case the disease began on the right ear and spread through the Eustachian tube to the uvula and left tonsil. These patients exhibited a temperature of 104° F. , glandular enlargement and inability to open the mouth. The pharyngeal mucous membrane was red, swollen and looked as if varnished , closely resembling some cases of simple pharyngitis , the diagnosis of erysipelas not being made till the face was affected.

In only one instance did a patient under my care in the Isolation wards complain of sore throat:- a boy suffering from erysipelas of the thigh, leg and foot. The throat presented the appearances found in a sub-acute attack of tonsillitis which speedily subsided under treatment and there was no reason to connect it in any way with erysipelas.

The occurrence of erysipelas on mucous surfaces, has been denied by Lawrence⁵⁶, who points out the frequency with which the disease skirts the lips and eyelids without invading the buccal or conjunctival

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mucous membrane. Copeland also seems to assert that the disease affects the skin alone and ceases to be. Erysipelas should a mucous surface be attacked but goes on to describe a case in which the pharynx and larynx were the seat of such an affection and states that it not unfrequently gives rise to a form of "consecutive croup".

There seems little doubt that affections of the throat may occur, essentially of the same nature as cutaneous erysipelas, and may at times threaten to destroy life by the rapid supervention of oedema glottidis for which tracheotomy may be necessary.

MALIGNANT ERYSIPELAS or BLACK TONGUE

In connection with erysipelas of the throat, it is necessary to briefly allude to a very remarkable series of epidemics occurring in North America of which this was a prominent feature. The first account of this affection, (Known later by the name of malignant erysipelas) is given by Bayard in the year 1822, the same year be it noted as the epidemic recorded by Gibson³⁴ and Stevenson³⁵ in Scotland, and about the same time that cases of throat affection in erysipelas began to be recorded in considerable numbers in this country.

Its prevalence steadily increased and "from 1841 onwards the disease grew into a pan-demic which did not cease until the beginning of the sixties "(Hirsch)⁴⁴. Since that time it has been less frequent.

The following account is abridged from Hirsch⁴⁴. The symptoms began either suddenly or gradually, the patient being attacked with great pain in the head, back, and limbs. Shortly after, pain on swallowing was noticed, and the mucous membrane of the throat was found to be reddened, swollen, and in severe cases of a dark purple colour. This discoloration extended to the gums, cheeks and tongue which was swollen and of a dark brown colour, from which circumstance the disease was popularly called Black Tongue. The mucous membrane of the alveolar margins frequently sloughed leaving deep ulcers.

The inflammatory process spread in some cases to the larynx and trachea, in others to ^{the} nares, antrum and frontal sinuses.

These symptoms continued for two or more days at the end of which time an affection of the integuments took place. This in slighter cases was of a bright red colour, and ran a course comparable to cutaneous erysipelas. Frequently the disease more closely resembled cellulitis, affecting the axilla with a wide spreading destruction of the deeper tissues, the skin being of a dark colour and speedily becoming gangrenous, when shreds of

connective tissue , muscles and glands were discharged in a sloughing state, and the fluid effused was so corrosive that steel instruments not immediately cleansed were destroyed as if by nitric acid. The face was the part most frequently attacked, the disease starting from the angle of the eye or nostril. Gangrene of the face or other parts frequently occurred with the most appalling suddenness. Visceral complications such as peritonitis, meningitis and pneumonia appear to have been of frequent occurrence.

The constitutional symptoms were as one would expect often of extreme gravity, though many cases on the other hand were so mild as to require no treatment. In favourable cases the throat symptoms subsided, the redness of the skin faded, and was followed by desquamation and the few secondary abscesses readily healed. In other cases the skin became bluish and sloughing or gangrene occurred and the patient rapidly sank in six to ten days, while in some severe cases death occurred as early as the third day.

The morbid anatomy of this peculiar affection is, but little known, owing to the fact that several members of the profession contracted the disease with fatal results in the dissection of the earlier cases. The bodies are stated to be emaciated and bloodless, the internal organs being congested , the

serous cavities filled with exudation, while the Peyers patches, mesenteric glands and spleen were swollen, soft and friable.

This affection seemed to have been widely distributed throughout the country rather than in towns and in the form of detached epidemics.

There has been considerable difference of opinion as to the nature of this disease. Volkmann regarding it as either diphtheria or an affection closely related to it. Hirsch⁴⁴ prefers to follow the majority of American authors in regarding it as a form of erysipelas. Austin Flint³⁷ describes it as erysipelatous fever, solely, he says, for want of a better name for it, and states that while erysipelas was not infrequent, it only occurred in a minority of the cases.

Schuller states that erysipelas and diphtheria may occur together and suggests that the American epidemics may have partaken of this mixed character.

ERYSIPELAS in CHILDREN

It has been noted by many observers that children suffer very frequently and very severely from erysipelas. This is doubtless accounted for by the greater susceptibility to injury on the part of the skin in early life and ^{the} presence of a raw sur-

face in infants at the umbilicus on the shedding of the funis. There is however some reason to believe that other conditions, loosely described under the name of erysipelas, have helped to swell the mortality attributed to that disease. One of these, first accurately described by Kinder[%] Wood as "ulceration of the pudendum" is frequently referred to as a form of erysipelas though more probably closely allied to can~~crum~~ oris.

This affection attacks young girls from 1-6 years of age, and febrile constitutional symptoms are followed by a livid redness of the vulva and surrounding parts, quickly passing into severe ulceration and generally going on to a rapidly fatal issue.

In a case of this description seen ^{4 me} some years ago in the course of Dispensary practice, the local appearances were not those of erysipelas, the colour being darker and slightly mottled, while the parts were much swollen and firm. The extreme general prostration resembled that observed in other diseases of this class. The fatality of erysipelas in early life led to the emphatic declaration by Trousseau⁸⁹ that infants attacked within 20 days of birth invariably die, but that from the age of 18 months erysipelas is not more serious than in adults, (in whom he regarded it as a slight affection).

This difference he explained by his belief

that in young children erysipelas was puerperal in origin but it is evident from his description, that in these cases cellulitis was frequently present and also inflammatory changes in the viscera.

CHAPTER III.

HISTORICAL SKETCH of OPINION REGARDING ERYSIPELAS.

Before considering the relations of the various classes of clinical phenomena described above, to one another, and their claims to be regarded as varieties of one affection, it appears desirable that a brief review should be given of the progress of medical opinion on this subject. By this means it is hoped that the seeming incongruity of associating symptoms so diverse under a common name will be at least partially explained.

Hippocrates⁴³ though he gives no formal description of the disease he calls erysipelas shews that he was perfectly familiar with it, and mentions many of its most striking characters. He evidently used the term to denote an inflammatory process affecting both the skin and deeper tissues, and he alludes to its seasonal frequency, its connection with sore throat, its liability to affect the head and face, and to occur in connection with slight wounds or even without obvious breach of surface. A tendency to rapidly spreading suppuration, sloughing and gangrene is also mentioned.

No definite theory of its aetiology is advanced except a statement that it is due to the

determination of blood to the part occurring in certain meteorological condition known as the "constitution" of the year.

It would appear that the immediate disciples of Hippocrates forsaking the stern regard for observed fact so characteristic of the Father of Medicine, began with the rise of the humoral pathology, to use the expression erysipelas to denote a species of inflammation which might attack the viscera, and which originated in certain hypothetical causes.

The works of Galen, which probably express the current opinion of his time rather than the results of personal ^{than of} observation, contrast markedly with the simplicity of Hippocrates.⁴³ He distinguishes erysipelas and phlegmon (simple inflammation) which he says resemble one another in being hot and swollen, but differ in so far that the former is pale and yellowish in colour, while the latter is red. Phlegmon is also characterized by throbbing, and is deep seated while erysipelas affects the skin. The cause of erysipelas he states to be the arrest of the yellow bile by the spores of the skin, (through which this humour should escape in the sweat) in the event of its being more abundant or viscid than natural. Phlegmon on the other hand is caused by simple excess of blood in the part.

Here we obtain the earliest statement of a

causal connection between biliary derangement and erysipelas, a view which has dominated the writings on this subject till the present century and of which suggestions may still be traced in medical literature. Here also is the foundation of the belief in the danger of metastasis and consequently of repellent applications. The surgeons of this early age do not seem to have expressed themselves so freely as to the aetiology of the condition, but, though using the term in a wide sense, their statements are more accurate than those of the physicians. Thus Celsus¹⁵ says "now that which I said has the name of erysipelas is not only consequent upon a wound but often happens without it, and is sometimes very dangerous if its seat be about the neck or head". He evidently included gangrenous affections for which he describes appropriate treatment.

It is unnecessary to do more than allude to the immense influence which the writings of Galen and the Greek school exerted over medical opinion in the Middle Ages. Without unduly multiplying instances of this, it is interesting to note that Fabricius de Aquapendente (famous as the master of Harvey) strongly supported the Galenic theory of erysipelas, which he amplified and explained in detail. While this theory of biliary causation remained undoubted, medical opinion in Germany took the direction of separating the suppurative from the non-suppurative affections, and limiting the application

of the term erysipelas to the latter class.

Thus Callesen⁴³ in 1783 states that erysipelas is an affection "which involves the surface of the skin and does not invade the underlying parts" also that "seldom or never is a true suppuration to be expected in Rose unless in some accidental manner it becomes a common inflammation".

Rust⁴⁶ also classes the cellulitic affections under the title of pseudo-erysipelas and thus separates them from cutaneous erysipelas, which he says "never causes suppuration, nor does mortification take place except when the constitution is bad or the concurrence of other unfavourable circumstances be observed".

In this country it is evident that John Hunter⁴⁷ perceived the importance of this distinction. He says "the erysipelatous inflammation is very peculiar, and most inflammations that are not of the true adhesive and suppurative kind are called so, although probably they do not in the least belong to it, and this may arise more from the want of terms, than the want of discrimination".

After describing cutaneous erysipelas he adds "when it (the inflammation) goes deeper than the skin into the cellular membrane it often suppurates; but then I suspect it is not the true erysipelatous".

An important epoch in the history of erysipelas was now reached although its significance was

not appreciated or even fully admitted for many years afterwards. I refer to the discovery of the contagious nature of the disease. The first suggestion of a contagious origin in erysipelas seems to have been made by Cullen²² who stated in the famous First lines of practice of physic that "it is possible that the disease may sometimes be communicated" from one person to another".

He also mentioned in his lectures a solitary instance in which the disease seemed to have been communicated in this manner which was observed in Edinburgh Infirmary.

He does not however appear to be quite convinced on the subject and seems to have believed that direct contact was necessary for the transmission of the affection and that when so transmitted the disease would start at the point of contact.

Baillie also from what he observed at St. George's Hospital and elsewhere in 1795-96 suspected the disease to be contagious but does not appear to have published his conclusions. (Wells²³)

The credit of first demonstrating by a series of cases that erysipelas might be communicated from one person to another belongs to William Charles Wells,²³ who while attending the lectures of Cullen in 1780 heard his opinion as to its possible contagious character. His attention was directed to the subject in 1796, by several instances in which erysipelas attacked the attendants of the patient, or those in

contact with him, and becoming convinced that the disease had spread from one to the other, an opinion supported by the experiences of Dr. Baillie and several others, he published the results of his observations in 1798. There is no evidence that this view was widely accepted in this country for nearly half a century though it was admitted as an occasional cause. On the continent the bilious hypothesis prevailed till a much later date, the contagiousness of erysipelas being only recognized in France, ^{about 1840} while in Germany it is not mentioned till 1862.

But while the contagious character of erysipelas was thus being demonstrated, and medical opinion in this country was so far ahead of that of continental authorities in this respect, it was far otherwise with regard to other points connected with this affection and its allies.

It was a time of nosologies, and the names of diseases with their numerous genera and species had become counters of most uncertain value, and indeed without the name of the author of the system of classification adopted, can have conveyed little or no information. Thus we find that in addition to all or nearly all the affections to which the term erythema is at present employed by dermatologists, British authors at this time and long afterwards used it to signify a disease to some extent

connected with erysipelas.

Thus Cullen²² says " when the disease is an affection of the skin alone and very little of the whole system, or when the affection of the system is only symptomatic of the external inflammation, I shall give the disease the name of Erythema, but when the external inflammation is an exanthema and symptomatic of the affection of the whole system, I shall then name the disease Erysipelas".

The name erythema thus was applied to the milder cases of cutaneous erysipelas while other nosologists still further extended its use till the distinction between it and erysipelas was one entirely depending on the classification adopted.

On the other hand confusion reigned as to the use of the term phlegmonous erysipelas, which in addition to its application to extensive subcutaneous sloughing was given by many to any case of an erysipelalous character in which suppuration occurred, even in the form of the minute secondary abscesses formerly described. Thus Arnott² states "we find both writers and practitioners describing as cases of erysipelas phlegmonodes those of erysipelas of the face complicated with abscess of the eyelids, or inflammation of the integuments of the trunk or extremities with the addition of a circumscribed abscess at one point of its extent."

It is evident also that the practical

disadvantages arising from the grouping together of cases of simple erysipelas and of destructive subcutaneous inflammation was becoming more fully recognized in this country, and proposals for the revision of the nomenclature of this class of affections are not wanting.

Arnett²⁶ questions the propriety of the term phlegmonous erysipelas even when used in the strictest sense thus :—"The term erysipelas has been made use of to denote inflammation of the skin simply : phlegmon to designate a circumscribed inflammatory swelling having a tendency to suppuration. But the diseased condition here spoken of is , it is unnecessary to say, neither phlegmon nor erysipelas, still less is it a combination of both. The skin may share inconsiderably in the inflammation and that too but secondarily and the wider extent of the disease renders the characters of a circumscribed tumour inapplicable ".

Earle²⁷ describes such cases as "diffuse cellular inflammation" and objects to the name phlegmonous erysipelas "because it is likely to be confused with common acute erysipelas and because I consider erysipelas essentially an affection of the skin : whereas the disease under consideration exerts its influence principally on the subcutaneous tissue and fascia".

The vague definitions of the various groups of phenomena to which erysipelas was applied as a generic

title had at this time become so complicated that the word had almost lost its claim to be considered a scientific term.

Travers^{ss.} indeed expresses himself in favour of its abolition. "To the term erysipelas I object, as undefined in its application, complicated with endless varieties, and a perplexing catalogue of different species which seems to augment in the hands of every additional describer."

Arnott¹ advocates a revised nomenclature of an extreme type in which the name erysipelas was to be restricted to the cutaneous affection as seen on the face alone and its accompanying febrile symptoms, while a similar affection in other parts of the body was to be simply regarded as an inflammation of the skin ~~and~~ the terms Erythema and Phlegmonous erysipelas were to be discontinued.

What the result of such a separation of erysipelas from the destructive conditions with which it is clinically allied would have been, it is impossible to say and perhaps useless to conjecture. In Germany, where at this period a more scientific classification had been adopted, it seems to have led to a more accurate conception of the diseases involved, and it is probable that had it been possible to give effect to some such change in this country, not only would the term Erysipelas have acquired a much more precise meaning than can be yet claimed for it, but much

subsequent confusion might have been avoided.

This dismemberment of the overgrown erysipelas genus was not to be - for before the tendency to separate the various species from one another had commended itself to the profession, they were again linked together under the old name though classified and defined in a more exact manner than had yet been done.

This result must be chiefly ascribed to Thomas Nunneley^{72.} who in his "Treatise on the nature causes and treatment of erysipelas" uses the term in an even more extended significance than any of his predecessors.

The importance of this work lies less in its being the most complete of the very few English monographs on this subject, than that instead of containing a collection of cases to illustrate some special point, it examines in some detail the opinions of the chief authors of the day with the view of detecting some principle underlying their discrepancies. It is not surprising therefore that his classification has been adopted in whole or part by many of his successors, and on account of its clinical and descriptive ^{ex}convience, has survived even after the views on which it was founded have been forgotten or disowned.

It is important therefore to briefly consider the grounds on which he grouped together certain diseases as "erysipeloid", and the meaning he

attached to this expression, which has established an apparent connection between several diverse affections which has obtained to some extent till the present day.

Nunneley⁷¹ states that owing to certain constitutional peculiarities, temporary or permanent, different persons, (or the same person at different times), are liable to develop two entirely different sets of symptoms after similar injuries. In one case the tendency is for the constitutional reaction to be sthenic in character while in local lesions inflammation tends to assume a limited or adhesive type. The other constitution is characterized by adynamic general symptoms and the tendency of inflammatory affections to spread diffusely. These constitutions, the former of which he names the "phlegmonoid," and the latter the "erysipeloid" diathesis, he regarded as the "extremes of a graduated scale between which there is every conceivable grade"

He illustrates this view by stating that in the phlegmonoid constitution a local injury will produce a limited local action (phlegmon) the part being surrounded by a effusion of coagulable lymph, within which, suppuration, if it takes place, will be confined; on the other hand no such barrier is formed and diffuse spreading inflammation or erysipelas is the result. In the same way what in the first set of circumstances takes the form of an attack of ordinary acute peritonitis, limited by the adhesion of the

effused lymph will in the latter constitution (of which puerperal patients partake) be diffuse and non-adhesive .

Starting with this dictum, that the essential feature of the erysipelatous process is its tendency to a spreading type of inflammation with asthenic symptoms, he proceeds to class together as erysipeloid diseases the following affections :-

- (1) Erythema as defined by Willan and Bateman except *intertrigo* and erythema nodosum.
- (2) Erysipelas of head, face, trunk or limbs, idiopathic or traumatic .
- (3) Diffuse inflammation of the cellular membrane (Duncan)¹⁴.
- (4) Puerperal fever.
- (5) Diffuse inflammation of serous membranes, especially the peritonitis which follows wounds or abdominal operations such as herniotomy.
- (6) Diffuse inflammation of the mucous membranes as seen about the fauces or larynx.
- (7) Probably some forms of Arachnitis .
- (8) Diffuse Phlebitis and diffuse inflammation of the absorbents.

Truly as he says the list is a formidable one and the diseases are of a most serious character. These he divides into two great classes. External and Internal erysipelas- the former comprising three varieties (1) cutaneous, (2) cellulocutaneous (3) cellular, as before described, these

owing their differences for the most part to the tissue chiefly affected, but being essentially the same and tending to shade into one another; the latter he also divides into three groups according as (1) Serous membranes (2) Mucous membranes (3) Veins or lymphatics are involved, these being further sub-divided according to the particular structure affected.

Here therefore we have erysipelas meaning less the local condition which had hitherto attracted attention, than an inflammatory affection of an asthenic type - "an increased disposition to act without the power to act with." The distinction between phlegmon and erysipelas is indeed as old as Galen, but Nunneley amplifies this doctrine from the researches of John Hunter⁴⁷ who first pointed out the respective association of adhesive and spreading inflammation with strength and weakness of the constitutional state. He quotes with approval Hunter's remark "I suspect that the erysipelatous inflammation has very little of the adhesive in its nature," as if claiming him as a supporter of the opinion that erysipelas and cellulitis are identical, while no mention is made of ~~his~~^{Hunter's} further statement that "when it ;the inflammation," goes deeper than the skin, into the cellular membrane it often suppurates, but then I suspect it is not the true erysipelatous".

The meaning of the whole passage in Hunter's

work is opposed to such a conclusion, and as may be gathered from the quotations previously given (p 37.) it seems to have only been the want of suitable terms which prevented him formulating the distinctions which his shrewd insight readily grasped, but here, (as elsewhere in his writings) he seems to have some difficulty in expressing. It must I think be conceded that Nunneley's idea of the essential nature of erysipelas - ~~a~~ spreading local lesion with asthenic general symptoms, forms too narrow a basis for grouping together diseases so different in anatomical character, though it was doubtless of great value in stemming the prevailing tide of opinion in favour of active depletion in any affection which was considered as "inflammatory" in character .

Indeed the survival of his classification even in some of the most recent surgical text books, must be taken as indicating its clinical usefulness, rather than the acceptance of the opinions on which it is based. The forms described as internal erysipelas have been tacitly abandoned, while there is a growing tendency to separate the other varieties from one another. The comparatively regular course of cutaneous erysipelas, in which suppuration only takes place in the occasional formation of small, well-defined, and for the most part insignificant abscesses, forms a striking contrast to the other varieties in which suppuration and sloughing are

the principal features and would on clinical grounds alone entitle it to rank as a separate and distinct disease. Along with it some of the slighter forms described as "erythema" must be included, (though the term in this connection is superfluous), probably also oedematous erysipelas as before defined, and such affections of the throat and other mucous membranes as are invaded from the skin or vice versa .

The cellulo-cutaneous and cellular forms differ from one another in degree rather than in kind (as Nunneley admits) and can hardly lay claim to rank as pathological entities. They may be classed together as cellulitis which thus forms a convenient clinical term for the effects produced by a variety of causes probably dependent on more than one poison. Such a condition may doubtless be associated with sore-throat and is liable to be accompanied by inflammation of the veins, lymphatics and serous membranes, without these lesions being necessarily of the same nature as the local affection.

I propose therefore in what follows to restrict the term erysipelas to the cutaneous variety of Nunneley , while the other two varieties of external erysipelas in his classification I will indicate by the more modern term cellulitis while in cases where reference to "erysipelas" in the more extended sense is necessary the word will be marked by inverted commas.

About this period Velpeau⁹⁰ was strongly insisting on the distinction between erysipelas and the inflammatory conditions with which it had been confused, and the necessity for regarding it as a general morbid process rather than as a local lesion. While he regarded contagion as unproved, he believed the essential cause of the disease to be a deleterious or toxic substance, capable of causing an extensive alteration of the fluids, and this poison he regarded as chiefly generated within the body of the patient. These opinions seem to have prevailed in France till the time ~~of~~⁸⁹ Trousseau, by whom the contagious character of erysipelas is fully admitted. He also was the first to point out the almost constant presence of some breach of surface, from which the disease starts in most of the cases of so-called "medical" erysipelas, an observation which has been amply confirmed. He attached great importance to the presence of sore-throat preceding attacks of facial erysipelas, an occurrence which seems to have been more frequent in his experience than in that of most other observers.

In Germany the bilious theory died hard and erysipelas was not recognized as a contagious disease till 1862, twenty years after Henle had adduced reasons for the belief that many diseases owed their contagious character to microscopic vegetable parasites.

Volkmann⁹⁶ definitely established the claims of erysipelas to be regarded as a traumatic infective disease, starting from a breach of surface often minute but generally discoverable if sought for at an early period.

About the same time Billroth⁷ states the poison of erysipelas to be probably of a particulate character, which might infect wounds either fresh or granulating, and was liable to be transported by dressings, instruments, or the hands of the surgeon, or to adhere to particular beds or wards.

From this time onward erysipelas may be said to occupy much the same position in medical opinion which it does today,⁹⁷ while the increase of information as to its pathology has been considerable, little has been added to our knowledge of the clinical characters of the disease, indeed some recent clinical descriptions^{or} panegyrics on reputed specifics for its treatment, indicate less accurate acquaintance with its natural course and termination than that possessed by Trousseau⁸⁹ and his contemporaries. It is probable that this is at least partly to be accounted for by its increased rarity and lessened importance since the general acceptance of the antiseptic method.

CHAPTER IV.

AETIOLOGY and PATHOLOGY of ERYSIPELAS.

From the earliest times there has been a tendency to associate the prevalence of erysipelas with certain conditions which were regarded as factors in the production of the disease, and though our knowledge of the part played by them is neither extensive nor complete, it is probable that were they more thoroughly understood they would throw some light on the manner in which the disease is propagated.

Thus Hippocrates⁴³ associates "erysipelas" with a special "constitution" of the year, the meteorological characteristics of which were its coldness and dampness and to this association many authors have given their support.

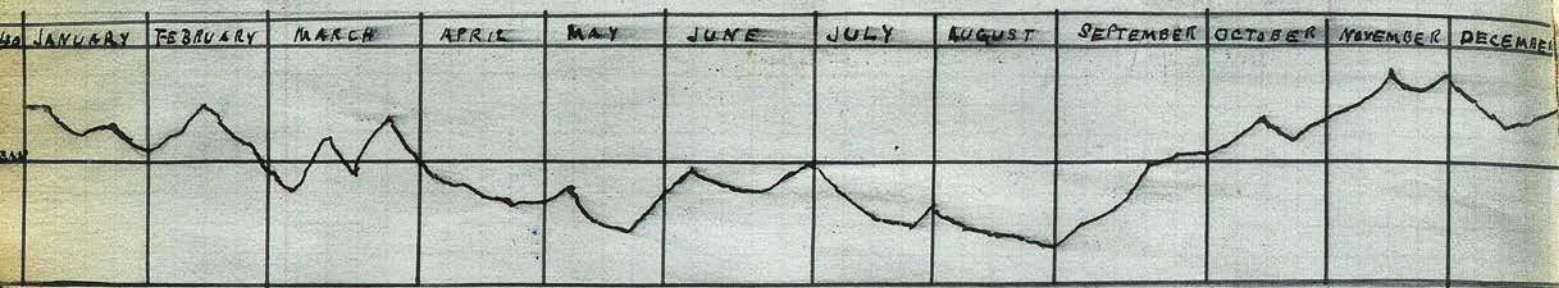
As regards the geographical distribution of the disease, Hirsch⁴⁴ states from an examination of the literature of the subject that while not unknown in any part of the world of which we have records, "erysipelas" exhibits a marked preference for the temperate zones of both hemispheres and even for the colder parts of them, while it seems to be comparatively rare in the tropics.



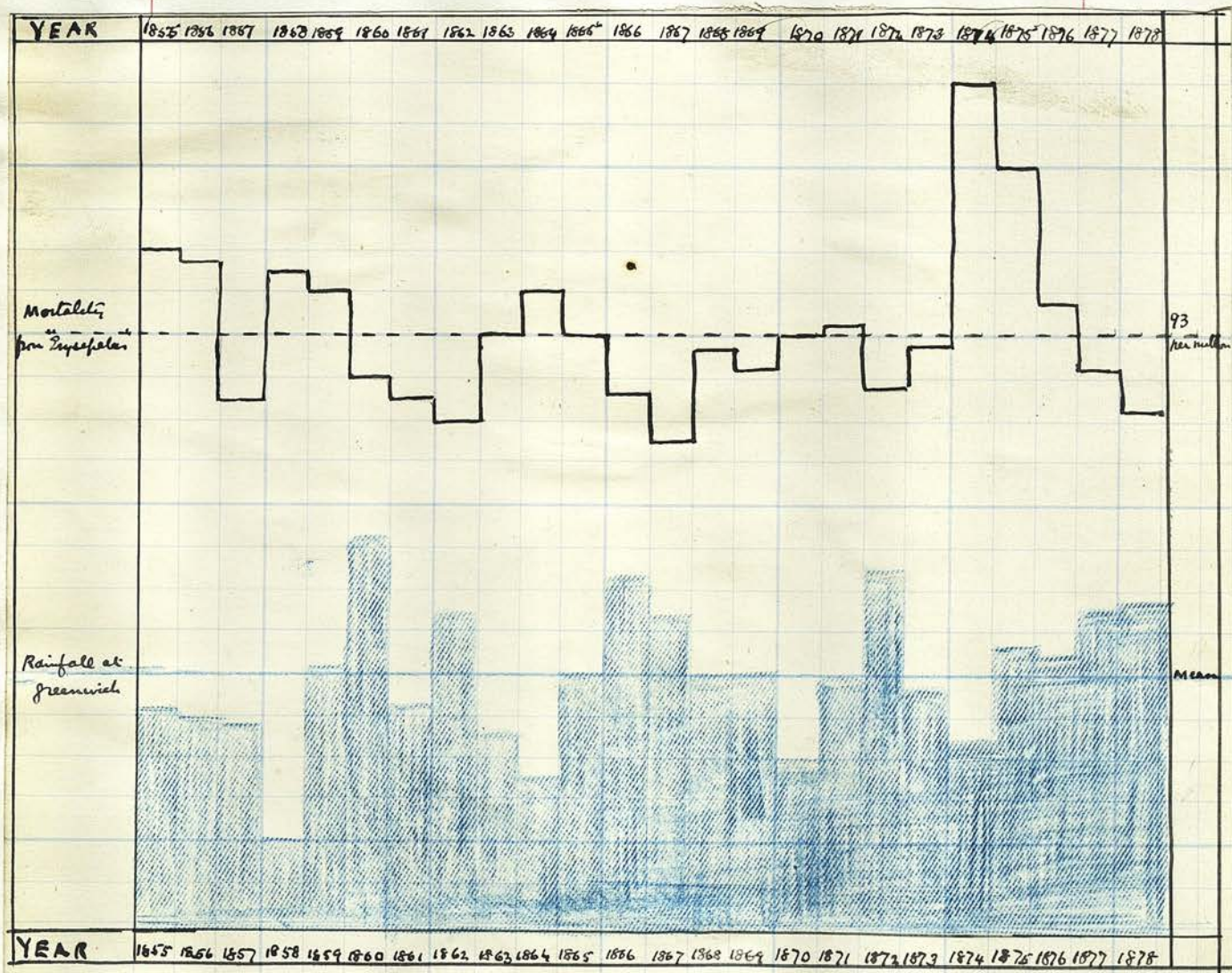
In agreement with this, is the statement of many observers as to its greater prevalence in the colder season of the year, more especially during spring and autumn - the important factor being stated to consist in damp and changeable weather rather than lowness of temperature.

It has been pointed out on the other hand that the prevalence of "erysipelas" in hospitals during these seasons is to be accounted for by the less perfect ventilation during such weather, owing to neglect in opening windows etc. This in an overcrowded and unhealthy ward might form a source of error, but it is important to remember though the chief recorded epidemics of "erysipelas" have occurred in connection with hospitals, especially in pre-antiseptic times, yet the disease is one which in many ways is independent of insanitary surroundings, and occurs ^{frequently} even in the country and in admirably equipped hospitals, and conversely has in some cases failed to appear in hospitals otherwise unhealthy.

Andersⁿ in an analysis of two thousand cases, found that in Philadelphia, the number of cases increased from August to April, (the maximum month) and then rapidly fell till August. He states that a combination of low barometric pressure with a mean relative humidity favoured the development of the disease, while temperature had but a slight influence.



Mortality from "Erysipelas" at all ages & both sexes, London 1845-1874 arranged to show prevalence at different seasons (from Buchanan & Mitchell)
 Each square = 10% above or below the mean



Mortality from "Erysipelas" in England & Wales from 1855-1878 with Rainfall in same period
 The horizontal line represents the mean death rate for the 24 years i.e. 93 per million living
 Each division represents a deviation of 10% from the mean. (after Longstaff)

In this country it has also been observed to prevail chiefly in spring and autumn, the actual maximum however occurring in the latter season in November. The accompanying charts represent graphically the mortality of "erysipelas" for all ages and ^{both} sexes in London for the thirty years 1845-1874, arranged to shew the prevalence at different seasons

More careful observation seems to shew that the mortality from "erysipelas" with that from certain other diseases, such as puerperal fever, pyaemia and rheumatic affections of the heart bears an inverse ratio to the rainfall, the variations in the mortality from these causes rising and falling together, in a manner which seems to point to some natural condition upon which their prevalence depends. (See chart at page 89)

This has recently been stated by Newsholme⁶⁶, the lowness of the ground water and the consequent influence of a warm and dry subsoil

A chart appended shows the fluctuations of the "erysipelas" death-rate for England and Wales for the years 1855-78, and also the rainfall at Greenwich for the same period, which illustrates this statement, although a very close correspondence is not to be looked for in the comparison of the general death rate with the rainfall of a single locality.

In this as in the previous charts showing

seasonal mortality, the figures represent the total returns for "erysipelas" in all its varieties and therefore doubtless embrace a large proportion of cases of cellulitis. Statistics showing the comparative prevalence or mortality of simple erysipelas are unattainable in this country.

It is evident from the occurrence of sporadic cases of erysipelas not only among the inhabitants of towns, but in rural districts, that the essential cause is widely diffused.

It is probable that it undergoes multiplication outside the body and that in most instances the disease arises spontaneously on exposure to its special poison without contact with a previous case.

Even in hospitals, where the majority of recorded epidemics have taken place, its range of infection has been observed to be but slight, the disease passing from bed to bed in some instances with perfect regularity. In the same way it may be confined to particular beds by the presence of some local cause as in the instance mentioned by Thomson⁸⁶, where in the Middlesex Hospital, the patients occupying beds on either side of a particular window were observed to be peculiarly liable to develop erysipelas. The cause was discovered in an uncovered dustbin placed immediately beneath the window, and on this being closed the disease

ceased to appear, till after a time it recommenced in the same beds and it was found the dustbin had again been left open.

It is probable that the majority of hospital epidemics have been caused by the direct transference of the poison from one patient to another, or in rarer instances by the exposure of a succession of patients to some common source of the specific organism. That this may occur in an unsuspected manner was proved by the well-known epidemic in the hospital at Rostock where König⁵⁴ succeeded in tracing the cause to the cushion on the operating table on which were some dried blood stains. Changing the pillow was sufficient to arrest the spread of the disease and the blood stains on being experimentally tested were found capable of producing erysipelas.

Since the general adoption of antiseptic measures of wound treatment, the danger of erysipelas becoming epidemic, even if introduced into a surgical hospital, has been reduced to a minimum.

Since the erection of the Isolation wards at the Royal Infirmary no instance is known in which a patient contracted the disease in them, in spite of the fact that a considerable proportion of those admitted to them do not suffer from erysipelas and there is no means of separating them from cases of that disease. In several instances such patients while under my charge required minor operations,

such as the opening of abscesses etc. while the adjoining beds were occupied by cases of erysipelas, and in no instance did infection take place, though the only possible precaution in addition to ordinary antiseptic procedure, was the simple one of always dressing the non-erysipelatos patients before the others.

There is also a personal factor in pre-disposition, more especially the occurrence of a previous attack, which so far from conferring protection increases the liability to subsequent ones.

Patients suffering from chronic and debilitating diseases, more especially of the kidney, have been stated to show a special proclivity to attacks of erysipelas.

In addition to these predisposing factors in the state of the patient and his surroundings, it is necessary that he be exposed in one way or other to the action of the essential cause of the disease.

It can no longer be admitted that a chill, exposure to a cold wind, or any article of food or drink, is an efficient cause of this affection nor is it to be looked for in any change occurring within the body.

Its contagious character demonstrated by Wells²³ as far back as the end of the last century, though slowly admitted, was sufficient evidence that the morbid material came from the outside, and on clinical

grounds alone Billroth⁷ concluded that the poison was particulate, though he had doubts as to its specific character, and was inclined to believe that dried decomposing discharges were able to convey the infection.

From Billroth's conception of the nature of the toxic agent which he says is "probably a dry dust-like substance which coming on the wounds, whether fresh or granulating, causes erysipelas" and which he further remarks, was capable of transmission by dressings or instruments, no long period intervenes before its parasitic character is suggested.

Huetter⁴⁵ seems to have been the first to suggest that this substance was a living organism of the class Schizomycetes, and described cocci which he found in the blood and serous effusion of the affected skin as the essential cause of the disease.

A similar result as regards the blood was arrived at by Nepveu⁶², the micro-cocci being most numerous in the erysipelatous area. Various observers have found organisms in the contents of the bullae in cases of erysipelas.

Orth⁷³ was the first to attempt to produce the disease in rabbits, by the injection of the contents of a vesicle which contained cocci. This experiment resulted in the production of a form of spreading inflammation, the effusion of which contained numerous organisms, and its injection into a

second animal was followed by a similar condition.

Lukomsky⁵⁷ from post mortem examinations of erysipelalous patients found both the blood vessels and lymph spaces of the skin at the margin of the affected area to contain micro-cocci, which were also present in the visceral capillaries. On injecting the effusion from these cases into rabbits, this observer produced a cellulitis in which the lymphatic vessels and lymph spaces contained micro-cocci.

Similar discoveries of micro-organisms in the tissues were published by Billroth and Ehrlich⁸ and also by Tillmanns⁸⁵, but only in cases where supuration had occurred, and these authors considered that cases of the purely cutaneous affection were not associated with organisms.

Koch⁵³ in his investigations of septic processes made numerous inoculation experiments with various putrid substances.

In one case after inoculating the ear of a rabbit with the dung of a mouse there followed an affection which he describes as erysipelas. The affected organ was swollen and congested so that the vessels were no longer recognizable on trans-illumination, and the animal died on the seventh day. The disease was not transmitted by the injection of the blood of the animal, but no attempt was made to inoculate with any material taken from the diseased part. On post mortem examination of the affected

animal neither lesion nor organism ~~was~~ detected in the viscera but the affected ear contained numerous rod-shaped bacteria .

From these results we may pass to the researches of Fehleisen³⁰ which are by far the most important investigations which have been made in connection with this part of the subject . He first by the examination of erysipelatous skin from the post mortem room , or minute fragments removed from patients, found that in the lymphatics of the skin and subcutaneous cellular tissue there were present chains of micro-cocci , the presence of which could be constantly demonstrated.

These were most abundant in the superficial layers of the corium and at the margin of the affected area where they were accompanied by oedema and an infiltration of small cells, while where the process was less acute the infiltration remained but organisms could no longer be detected . He differs from previous observers in asserting that these micro-cocci are never seen in the blood vessels.

In endeavouring to cultivate this organism he first attempted to do so from the contents of the bullae, but found that these were not to be relied on, some vesicles being sterile, while others contained various organisms. He therefore had recourse to the excision of minute particles of skin,

removed with antiseptic precautions, and found that by placing these in tubes of liquified jelly he was able to obtain a growth which could be transferred to other tubes in the usual manner.

Having by ^{repeated} cultivation procured a pure culture rabbits were experimented on and inoculation was followed by a rise in temperature and a peculiar and characteristic inflammatory process. The seat of inoculation (the ear of the rabbit) showed a progressive area of redness without great oedema, and sharply defined at the margin, which spread over the ear, and was recovered from, without suppuration. The anatomical characters of the artificial disease agreed closely with those ^{seen} in human skin and the author regards the result of his experiments as more nearly resembling the symptoms and morbid anatomy of erysipelas than those of Koch⁵³ and Ziegler.⁷²

A final stage in the investigation was the inoculation (for therapeutic reasons) of seven patients with the pure culture of the organism, of whom six took typical erysipelas. The claims of this streptococcus to be regarded as the essential cause of erysipelas would therefore seem to be fairly established.

It has however been asserted by several observers as Baumgarten, Fraenkel³³ and others that this organism cannot be distinguished from strepto-

coccus pyogenes and in fact represents an attenuated form of that organism. The grounds for this statement seem to be the great similarity of the microscopic and cultural characters of these organisms.

In view of Fehleisen's experiments in which both in man and animals artificial erysipelas was repeatedly produced without the occurrence of sup-^{it is impossible}uration, by cultivations of various ages, that the organism described by him is identical with one whose pyogenic character is undoubted; nor does the proof seem sufficient, with rare exceptions, where ~~by~~ characteristic staining reactions or some marked peculiarity of form or arrangement, ^{exist,} it may be safely said that an organism cannot be identified by microscopic characters alone.

The method of growth or nutrient media is much more characteristic, indeed the variety in this respect is remarkable and certainly far greater than one would expect a priori, at the same time similar appearances on nutrient gelatine do not necessarily imply similarity when cultivated in other ways, and even the coincidence of similar appearances on various soils, can warrant no statement as to the similarity of pathogenic effects, which can only be proved by direct experiment.

The experiments of Fehleisen³⁰ have been repeated and confirmed by Klein⁵² who is convinced of the specific nature of the strepto-coccus

erysipelatois. He says "the cultures and microscopic specimens of this streptococcus are difficult to distinguish from streptococcus pyogenes but inoculation into the rabbit's ear shews the difference". He adds that the injection of large quantities of this organism into the veins of the rabbit produces in many cases acute septicaemia ~~with~~ congestion of all the organs, while the organism can be readily cultivated afresh from the blood of the systemic circulation.

Klein⁵² also states his belief "that the name streptococcus pyogenes does not cover only one species but is the name of a group of different species varying in many details though they have a number of characters in common, and only on closer observation in the different media and by the result of inoculation of animals can these differences be made out".

A point of some interest to which I can find no reference is the bacteriology of the small abscesses complicating or following attacks of erysipelas. I recently succeeded in obtaining from such an abscess following erysipelas of the face, an organism which grew in the form of minute spherical points in the gelatine. These were nearly white in colour and exhibited a marked resemblance to a cultivation of streptococcus pyogenes. The manner of growth did not exactly recall that of a coccus I had formerly cultivated from the advancing borders of the erysipe-

latous area but unfortunately I was entirely unsuccessful in my attempts to obtain a fresh specimen of the latter organism to compare with it.

While in charge of the Isolation wards I on several occasions succeeded in getting growths of this coccus from the blood at the margin of the erysipelalous area or just within it.

Its cultural characters are very like those of streptococcus erysipelatosus but in the absence of experimental evidence its identity was not established.

It seems to occur in the situation mentioned without admixture of other organisms. At least the growth was uniform in character but grows extremely sparingly and at least in my hands two out of three tubes shewed no result.

It has however been stated by Rosenbach⁷² (who is also convinced of the specific nature of Fehleisen's coccus) that streptococcus pyogenes may be associated with the streptococcus of erysipelas and give rise to suppuration in the deeper tissues. If this is the case it may explain their supposed identity, and also make it much more difficult to decide the nature of the organism obtained from cultural characters alone.

The organisms which occur in cellulitic processes are various and include all the forms of

pyogenic cocci and several other species .

In some of the more acute processes of this kind such as some whitlows streptococcus pyogenes has been found or in association with staphylo-
coccus ^{pyogenes} aureus.

CHAPTER V.

TREATMENT of ERYSIPELAS.

As may be expected from what has been already stated as to the differences of opinion which have obtained in the past as to the nature of erysipelas, the methods of treatment have been still more varied.

It would be impossible to mention , much less discuss, more than a small proportion of the particular therapeutic agents which have been employed at one time or another in the treatment of this affection. I shall threrfore confine my attention to the chief principles which have guided the treatment of this disease and refer more minutely only to such methods as I have had an opportunity of observing.

GENERAL TREATMENT.

In the works of the earliest medical writers the treatment of the disease described, is not always mentioned and indeed the almost complete silence of Hippocrates^{43.} on this point has led some of his commentators to assume that venesection was

practiced by him as a routine measure in all cases where the contrary is not expressly stated.

Whether this assumption is more than a reflection of the practice of their own time is open to question ; but in the case of "erysipelas" occurring as a complication of a wound of the head we have the direction given by him that a purgative which will evacuate bile should be administered when he says the fever goes off , the swelling subsides and the patient recovers.

This judicious and successful treatment contrasts favourably with the heroic measures of his followers, for throughout the middle ages and till the beginning of the present century erysipelas like every disease which partook of a febrile or "inflammatory" character found its routine treatment in the use of the lancet.

So freely was venesection resorted to that when we consider the depressing nature of the disease we can only wonder that it should have been possible to chronicle a recovery.

Towards the close of the 18th century an opposing school began to make way whose members advocated that (among other similar conditions) erysipelas should be treated on an entirely opposite principle - the administration from the outset of tonics and stimulants in large doses.

Nunneley⁷ gives copious quotations on this

subject which in the earliest part of the present century was very debatable ground. These he divides into three classes -

(1) Those authors who believed venesection and anti-phlogistic measures.

(2) Their direct opponents who advocated free stimulation.

(3) A moderate party to which he himself belonged "those who neither altogether forbid the lancet nor indiscriminately recommend stimulants"

The advocates of bleeding include the names of Sydenham, Andrew Duncan Jr.²⁴, Syme⁶⁴, Stevensen⁸³, and Sir William Lawrence⁵⁶, while those who relied on stimulants number among others Fordyce³², Wells⁷³, Pott⁷⁶, Abernethy, Mason Good³⁶, and Sir Astley Cooper.¹⁸

The moderate party which judged from a modern standard, seems much more nearly allied to the former, embraces the names of Nunneley⁷⁴, Dupuytren²⁶, Cullen²⁴, James⁵⁰, Liston⁵⁷, and Copeland.¹⁹

The direct opponents of venesection were those who approved of the administration of alcoholic stimulants and aromatics in all cases (of erysipelas) and from the commencement of the patient's illness. In addition to these, cinchona bark was almost regarded as a specific in fevers, as well as "anti-septic" in those which had a "putrid" tendency. It was therefore freely administered in erysipelas by many physicians, Fordyce³² directing it to be

given in substance "in as great a quantity as the patient's stomach can bear, which is commonly to the quantity of a dram every hour".

Sir Astley Cooper¹⁶ speaks highly of alcoholic stimulants, especially gin, and also of quinine which he found to be better retained than the powdered bark .

Such was "tonic" treatment even in the hands of its extreme exponents in the early part of the century , while the majority of those who did not practice venesection were in the habit of prescribing tartar emetic, mercurials, and other depressing remedies and only had recourse to tonics and stimulants in convalescence.

The value of stimulants combined with proper feeding in acute diseases was soon after this established on more liberal lines by the teaching of various physicians, especially Graves³⁷, whose labours in this direction are well known.

The treatment of erysipelas also partook of this improvement and from this period onwards there has been no return to methods of an "antiphlogistic" character.

In 1851 Dr Hamilton Bell⁶ introduced the practice of administering Iron in erysipelas, which rapidly came into general use in this country, and may be said to retain its reputation at the present time .

Its value however has been very differently estimated by different observers, and while it is claimed by some as an infallible specific, it is said by others to be entirely useless.

The preparation used by Bell⁶ was the muriated tincture of iron of the Edinburgh Pharmacopia given in doses ranging from 15 - 25 drops every two hours along with simple local treatment (hair powder and cotton wool) and he believed it distinctly acted on the disease and shortened its duration.

This view has been supported by many other writers, thus Campbell de Morgan⁶⁵ regarded it as almost infallible and that the disease might terminate on the fourth day when treated with iron while treated in other ways it lasted seven or ten days. He advises that it should be given in doses of half a drachm per hour, a purgative being given at the beginning of the attack and stimulants freely administered.

In opposition to this and similar favourable reports on the use of iron, some equally decisive as to its total want of specific effect might be quoted.

Among others we find Todd⁸⁷ advocating extremely free alcoholic stimulation with beef tea etc. in large quantities. He does not object to the use of iron as it indicates at least a non-depressing line of treatment, but regards it as quite ineffec-

tual to alter the course of the disease and as little to be trusted by itself as "any homeopathic absurdity".

If restricted to one remedy he states that he would choose brandy which he considers an "antidote to the erysipelatous poison". He says further "With a commissariat well supplied with brandy, and simple means to keep the bowels open, I think I could engage to keep erysipelas at a minimum among the wounded in our army in the Crimea".

With Todd⁸⁷ the plan of high stimulation may be said to culminate, if not actually to run into excess and all readers of Professors Gairdner's "Physician as Naturalist" will recall the severe criticism therein contained on his free administration of alcohol in other acute diseases, especially typhus.

The expectant plan of treatment found a powerful advocate in Trousseau⁸⁸, who beyond an enema or simple aperient (castor oil) had but little resort to drugs in this affection. He kept the patient in bed to avoid chills, administered abundant nourishment, and waited for spontaneous recovery. This method he states he had practiced for twenty eight years and he had thus treated a large number of cases with but three deaths.

That this indicates the proper line of treatment to be pursued I think scarcely admits of

a doubt.

Trousseau's large experience shews that the mortality in uncomplicated cases is not high.

It is extremely doubtful if the course of the disease can be directly influenced by drugs.

In the Isolation wards various plans of treatment were adopted. On admission a purgative was administered (usually sulphate of magnesium) and repeated if necessary during the course of the disease. In nearly all cases alcohol was given from the first, usually in the form of brandy or whiskey, in the quantity of half an ounce every four hours for an adult, increased or given more frequently as required. In young persons and occasionally in convalescence port wine was substituted for the spirits. In all cases the patients were kept in bed and warmly clad and fluid food in the form of milk and beef tea freely administered and no solid food allowed till after the crisis.

As regards drugs, in the earlier cases, iron was given in the form of the officialⁿ tincture of the per-chloride^{B.P.} in doses 15 -30 minims every four hours. In many cases, especially those in which gastric derangement already existed, this seemed to add to the sickness, and in one or two to such an extent as to interfere with the supply of nourishment, and it was therefore discontinued. I also made trial^{ER} of the muriated tincture of iron and in the few

cases in which it was given it seemed to be more readily tolerated by the stomach.

As far as could be judged no effect on the duration or course of the disease was produced by either preparation, and the progress of the patients was in no way affected by it.

Quinine was given in a few cases but seemed even more than iron to augment the gastric symptoms. It had no effect in controlling the duration of the disease, and its effect on the temperature was distinctly inferior to the use of the ice cap applied to the head.

Latterly no general specific treatment was employed, and beyond the administration of food and alcohol, drugs were not administered in all cases. Occasionally digitalis was required in addition to the alcohol and where there ~~was~~ much restlessness the hospital preparation of bromidia or small hypodermic injections of morphia were given.

In a few cases gastric symptoms required treatment even when no iron was given, and relief from the discomfort or danger of high temperature was most efficiently obtained by the use of the ice cap to the head even when the scalp was affected.

Along with these there was adopted the local treatment to be afterwards described, and in spite of the excellent results recorded from the administration of quinine, aconite, or pilocarpine I am

of the opinion that with sufficient and proper food, and in addition a suitable and moderate proportion of alcohol, in small quantities and at tolerably frequent intervals, drugs, will rarely be necessary, except to meet symptoms such as constipation or insomnia.

LOCAL TREATMENT.

While the bilious theory of the nature of erysipelas was in the ascendant and it was believed that the "peccant humour" was endeavouring to escape by the skin, this belief necessarily implied that its elimination was to be promoted and that the local application of any repellent remedy would probably be followed by a dangerous metastasis affecting some internal part. Thus for a long period it was considered dangerous to apply anything which was wet, cold or greasy to the erysipelatous part. Hence arose a method of treatment which is still familiar, the simple dusting of the affected area with some dry powder such as flour, starch, calamine, prepared chalk etc.

As the possibility of metastasis became less dreaded and the disease was regarded as a form of local inflammation, it became the practice to endeavour to arrest its course by active local

treatment combined with the employment of venesection and general antiphlogistic measures.

For this purpose such methods as local bleeding, blisters, mercurial inunction and the actual cantery were freely employed.

In addition to the use of cupping and leeches, the topical ^sabstraction of blood was attained by making a number of incisions through the skin of the affected area, each about one, to one and a half inches in length and two or three inches apart, and varying from 6 -18 in number according to the size of the reddened area. This method was introduced in 1814 by Copeland Hutchison⁴⁹ and was practiced early in the course of the disease in order to prevent suppuration. It was modified by Sir William Lawrence⁵⁶ who preferred a single incision throughout the whole length of the affected part. (A case is recorded where an incision was made from trochanter to malleolus !)

A further modification, this time in the direction of mitigated severity, was introduced by Sir Richard Dobson²³, who employed a large number of superficial punctures rapidly made with the point of a lancet over the whole affected area, and especially over oedematous parts as the eyelids. This method was ultimately adopted as most suitable for cases of simple erysipelas, and is very favourably spoken of by many authors especially by

Bright,¹⁰ Liston⁵⁷ and Nunneley.⁷⁴

As to the necessity for incisions in cases of cellulitis after suppuration has taken place, there was no question, but the practice of Hutchison and Lawrence and even of Dobson probably may help to account for the belief that suppuration frequently occurred in simple erysipelas, as in many cases the bleeding was encouraged by warm sponges, poultices or fomentations, all probably of doubtful cleanliness.

It is also necessary to emphasize the fact that these incisions were made at an early stage, as in some recent books they are confused with those necessary for the evacuation of pus.

Mercurial ointment rubbed upon the part was recommended by Ricord, but according to Nunneley⁷² with no other result than the production of usual constitutional effects of the drug and that in a most unpleasant manner.

The actual cautery lightly applied to numerous points on the affected area, especially near the wound, was employed by Baron Larry⁵³ who states that it stops the disease and stimulates the tissues to healthy action. It never seems to have come into general use, at least in civil practice.

In 1829 Higgenbottom⁴² introduced the plan of painting the affected surface and neighbouring

parts with a strong solution of nitrate of silver, and made the first suggestion of an entirely new line of treatment. He advocated the application of this solution ~~or~~ the solid stick of caustic to the sound skin in such a way as to encircle the patch of redness, with the view of limiting the spread of the disease. This method seems to have been very largely employed not only in this country but on the continent, and though nearly all authors who mention it speak of its occasional success, the failures seem to have been much more numerous.

Blisters are highly spoken of by Dupuytren²⁶, and his practice was followed by many British surgeons. They were not only applied at the border of the affected area, several cases ~~are~~^{being} recorded where they seem to have arrested the disease when employed as a belt round the limb above the disease.

Velpeau²⁷ advocated the local application of sulphate of iron in the form of a lotion or ointment rubbed into the part, and this and other external preparations of iron were extensively employed in this country about forty years ago, at the time when the internal administration of the drug was regarded as specific in erysipelas.

Many other applications having for their object the local arrest of the disease by the use of preparations of carbolic acid, corrosive sublimate iodoform, creolin, camphor etc as antiseptics, as

well as many of a purely protective nature, such as chalk ointment, white paint or collodion have recently been employed with varying degrees of success.

The chief interest however is attached to those methods by which it has been endeavoured to limit the spread of the disease by opposing to its advancing border, some barrier to its progress. As it is now recognized that the fever depends on the local condition, and its duration depends on the extent to which it spreads, it is evident that the discovery of an efficient "limiting method" would prove a most valuable addition to the therapeutics of erysipelas.

In addition to the means above mentioned as employed for this purpose, it has been sought to effect it by subcutaneously injecting a one per cent solution of carbolic acid at intervals round the reddened area, a method which though stated to be occasionally successful is liable to produce sloughing. (Huxley)^{46.}

The patch of redness has also been surrounded by a belt of superficial scarifications which were afterwards treated with antiseptic fomentations (Mc Intosh)^{62.} and several mechanical methods have also been described as successful (Beall)^{47.}

The most important recent research in this direction with which I am acquainted and one which

has led to the use of a method at once simple and successful is that described by Dr. Miles⁶⁴ in the first volume of the Edinburgh Hospital Reports.

The application used by him is the pharmacopial liniment of iodine applied in a special manner. Iodine was originally introduced as a local agent in the treatment of erysipelas by Nunneley⁷² and he like Norris⁷³ used a strong solution in alcohol or ether which they painted over the whole area of redness and the surrounding skin, but neither of them seems to have attempted to limit the disease by its use, much less to do so on a definite scientific principle.

It has been previously stated that the streptococcus on which the disease depends advances beyond the margins of the reddened area into skin which shows no change to the eye though tender on pressure with the finger.

This "zone of tenderness" was first demonstrated to me by Dr. Miles and I have ^{only} seen it described by Zuelzer⁷⁰ ^{being} it is not usually mentioned in books. The edge of this zone therefore, not the margin of the redness, forms the true limit of the disease, the latter being the beginning of an area of dilated vessels from which issue the leucocytes to contest the invasion of the organisms. (Metschnikoff)⁶³

If therefore a congestion can be excited a head of the area of tenderness or true spreading

margin of the disease, the natural defensive machinery of leucocyte emigration will be called into action and the disease may be thereby arrested. Dr. Miles⁶⁴ after experimenting with various substances for this purpose found the most suitable to be the ordinary liniment of iodine applied with a brush in the form of a belt about half an inch wide and "about one inch from the margin of the affected skin, the limit of disease being reckoned by tenderness on slight pressure, which is usually found to be well in front of the red area".

This method was subjected to several experimental tests:- by enclosing areas of sound skin which remained unaffected by erysipelas, and by leaving gaps in the iodine belt through which the disease spread, to be successfully arrested further on. In about half the total number of cases treated by Dr. Miles, this method succeeded on the first application and when a second belt was required, it was almost invariably successful.

This method was adopted in the treatment of the majority of the cases under my charge in the Isolation wards and I have been able to repeat and confirm many of the observations recorded by Dr. Miles .

Unfortunately from an erroneous conception of the "spreading margin" the iodine was applied in a considerable number of cases about an inch in

front of the area of redness and therefore in the majority of cases was probably not in advance of the disease.

To obtain satisfactory results the limits of the zone of tenderness must be defined and the iodine applied in advance of it, and after I obtained a correct description of the method (then unpublished) I found its failure to arrest the spread of the disease to be very exceptional in favourable circumstances.

It was most reliable on the limbs and face, but when the scalp was attacked I have rarely succeeded in limiting the spread of the disease, probably from the difficulty of accurately applying it. On the trunk also it has seemed to me less successful, as in at least two cases I was entirely unable to stay the progress of the disease which spread very rapidly over the whole dorsal region, from the neck to the nates and round on to the front of the abdomen. The rapidity with which the disease spread in these cases, suggests that the laxity of the subcutaneous tissue in this part of the body may permit of a more rapid advance of the organisms, while at the same time there being less tension the tenderness is less marked, so that it may be advisable to apply the iodine at a greater distance from the margin of redness than in other situations.

In addition to this method I have in two cases endeavoured to arrest the spread of the disease mechanically, by the application of narrow strips of adhesive plaster, a method of which successful cases have been recorded on the continent and in America.

In one case where such a strip was applied round the forehead the disease was apparently arrested, as it extended to the plaster but did not pass ^{under} it ~~by~~ directly, and only spread to the scalp by extending on each side as far as the temple, where the presence of the hair prevented the close adhesion of the plaster.

In the other case when applied to the arm it was entirely unsuccessful and a limiting belt of collodion was equally useless in two cases, in arresting the progress of the disease.

The rationale of mechanical pressure is not quite clear, but it appears to imitate the natural arrest of erysipelas which frequently takes place at the root of the neck, crest of the ilium and similar situations where the skin is less movable on the deeper parts.

Since Unna directed attention to the use of ichthyol in erysipelas in 1886, no drug has been more largely used as a local application in this disease, especially in Germany. It has been stated that it has a specific antiseptic action on the

cocci and therefore directly limits the spread of the disease and shortens its duration.

It has chiefly been employed in the form of a collodion or made into an ointment with lanoline. I have frequently employed the latter spread in a thick layer upon lint, and while I believe it to be the most effectual application we possess for the relief of the burning itching pain so frequently distressing to the patient, I have never had any reason to believe that it can alter the duration of the disease which I have seen spread rapidly where it has been used. It may be applied even to the face and scalp and though an unsightly application, is often much appreciated by patients. The collodion is probably more suitable for use on the face, but even ordinary collodion will give relief, probably by its protective and compressive properties, which in most situations are more effectually obtained by the use of a light wool dressing and a firm bandage.

Of some of the more recent methods I have no practical experience but from what I have seen of erysipelas, I cannot believe that it is necessary to make superficial incisions and rub in ichthyol^(Pluck) or to spray the face with an ethereal solution of corrosive sublimate^(Telamon) which ~~was~~ stated to generally produce blisters^(Telamon), as has recently been recommended nor would I look upon cases which

terminated in a week under such treatment as triumphs of surgery, but rather as Nature asserting herself in the face of rather serious obstacles. The pathology of the disease has outrun its therapeutics at least in the text books of the day and a further study of ^{its} ~~the~~ natural course ~~of the~~ ~~disease~~ will doubtless confirm Trousseau's statement that spontaneous recovery is the rule in erysipelas.

RELATION of ERYSIPELAS to OTHER DISEASES.

(1) Puerperal Fever.

It is scarcely possible to dismiss the subject of erysipelas in its historical aspects without touching on it in a connection fraught indeed with controversy on which the last word has not been uttered, but still of great interest and importance - its alleged alliance with puerperal fever.

Modern medicine has learned to regard "puerperal fever" as a clinical term as indefinite and as loosely used as I have endeavoured to show "erysipelas" to be. In the past however (and it would not be difficult to find evidence of some such opinion at the present day) there have been no two diseases between which a closer affinity has been asserted to exist than erysipelas and puerperal fever, whether they were regarded as identical in nature , or the latter as being capable of arising from the former in some mysterious manner.

The identity was first asserted by Pouteau⁷ of Lyons in 1750 in these words "Par l'inspection attentive de ces cadavres (of women who had died of puerperal fever) je crus appercevoir les ravages des inflammations eresipelateuses" and goes on to state that on the strength of this hasty analogy he successfully treated cases of puerperal fever.

with large doses of camphor, that drug being also used in erysipelas. This statement as to the identity of puerperal fever and "erysipelas" was readily accepted by British obstetricians, and was doubtless supported by the observed coincidence of the former disease with the cellullitic affections classed as "erysipelas" in this country. Before a century had elapsed from the publication of Pouteau's opinion we find Nunneley⁷² asserting "This much at least I am sure of, that many questions in medicine which by common consent are regarded as settled, do not rest upon stronger evidence, if so strong as that which has been adduced in favour of the identity of erysipelas and puerperal fever." In France also a somewhat similar opinion continued to prevail and Trousseau⁸⁷ attributes erysipelas in new born children to the same cause as puerperal pyaemia in the mother.

That he refers to something more than purely cutaneous erysipelas (which he did not consider a very fatal affection) is evident in that he states that "erysipelas occurring during the first fifteen or twenty days of life is inevitably fatal" and after describing the treacherous character of its symptoms he adds "on examining the body after death pus will be found in the cellular tissue, sometimes suppurative pleurisy, more frequently phlebitis of the umbilical vein, of the vena porta or peritonitis." This he regarded as an extension of erysipelatous inflammation to the blood vessels or internal parts, these varied lesions being but

manifestations of one disease.

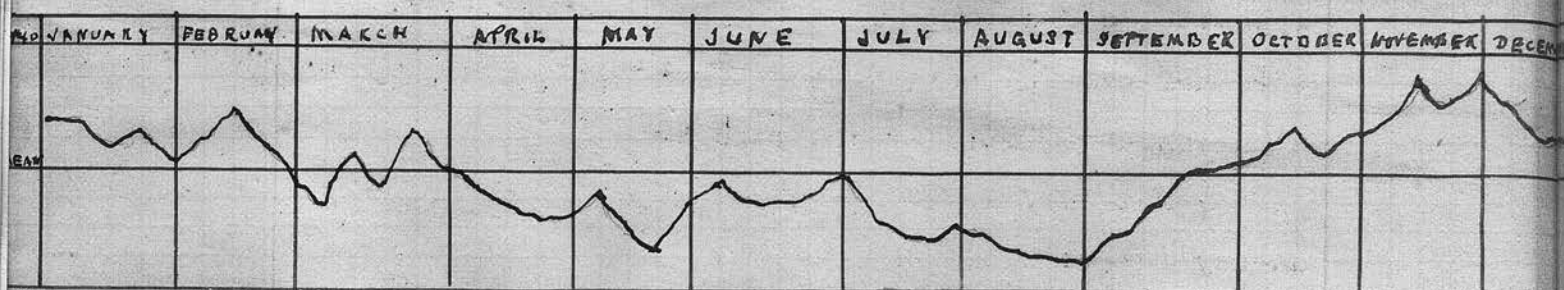
The opinion that an aetiological connection exists between erysipelas and puerperal fever is based on the following classes of facts which I quote in the words of Hirsch⁴⁴ in whose work copious references on this point may be found.

- "(1) The coincidence in time and place of the two diseases in epidemic form, both in lying-in institutions and among the population at large."
- "(2) The familiar fact that women in labour attended by doctors or midwives who were suffering themselves from erysipelas or who had come into contact with erysipelas patients, have taken puerperal fever."
- "(3) The converse fact to (2) that doctors, midwives, nurses and other individuals who come into close contact with puerperal fever patients suffer from erysipelas remarkably often : also that the newborn children of mothers with puerperal fever die of erysipelas in an unusually large ratio."
- "(4) The fact vouched for by many observers that child-bed fever itself has not unfrequently an erysipelatos character, if I may so speak, or in other words, the disease begins to develop from an erysipelas which mostly arises in the lacerated vaginal mucous membrane."

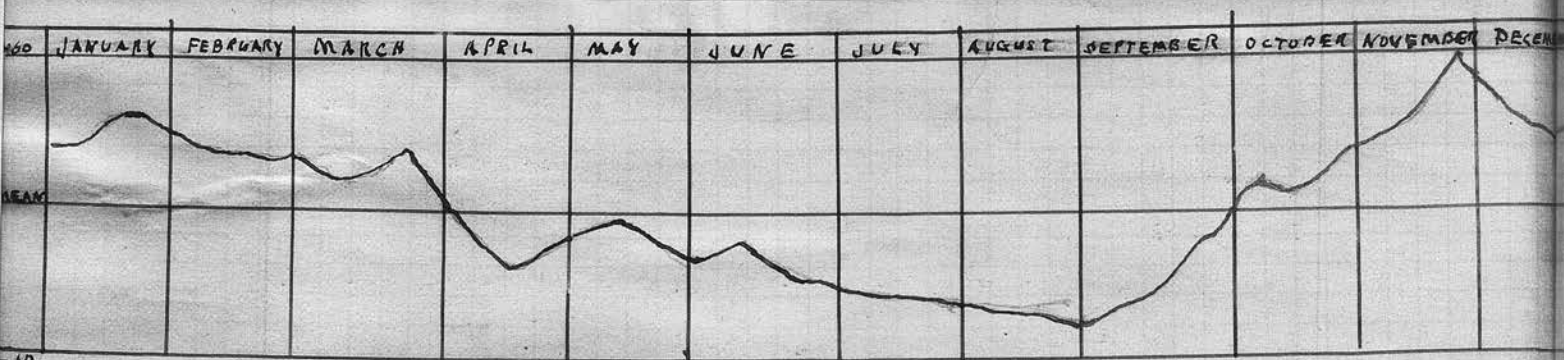
In commenting on these statements, the first place must be given to the admission of Hirsch himself who says "I am aware that many of the above observations and many more of the same kind

(especially some of those from English sources) which have been adduced to prove the intimate or genetic connection between child-bed fever and erysipelas, do not possess the value of evidence, in so much as they relate not to erysipelas but to diffuse phlegmon of the connective tissue and such like processes; also that erysipelas neonatorum is in many cases to be taken as not **true** erysipelas but as septic phlegmon of the connective tissue". He however states his belief that many cases of "érysipéle légitime" have given rise to puerperal fever. In none of the cases quoted by him is it clearly stated that the disease was of the cutaneous type, while the majority of them are from English and American sources and the repeated mention of "abscesses etc" make it evident that other processes were referred to .

Now there is ample clinical evidence in favour of a connection between suppurative affections such as cellulitis and the inflammatory lesions which are classed as puerperal fever, and indeed were such wanting the teachings of bacteriology would warrant the supposition , but until it is shown that cutaneous erysipelas is aetiologically identical with cellulitis, cases showing this connection as Hirsch says "do not possess the value of evidence" in relation to erysipelas. This therefore excludes ~~most~~ of the data on which this opinion is founded and there are not wanting facts in support of an



Mortality in London from "Erysipelas" at all ages & in both sexes 1845-1874. Showing monthly prevalence. Each square represents a deviation of 10% from the mean death rate.



Similar chart for mortality from "Puerperal fever" London 1845-74
(From Buchan & Mitchell)

Chart on following page shows mortality from "puerperal fever" "erysipelas" & "rheumatic affections of the heart" compiled from the total death rates from these diseases in England & Wales 1855-1878. Also the rainfall at Greenwich for the same period. The horizontal lines show the mean death rate for the whole period while each square represents a 10% deviation from that mean ~~in~~ per million persons living.

(After Longstaff.)

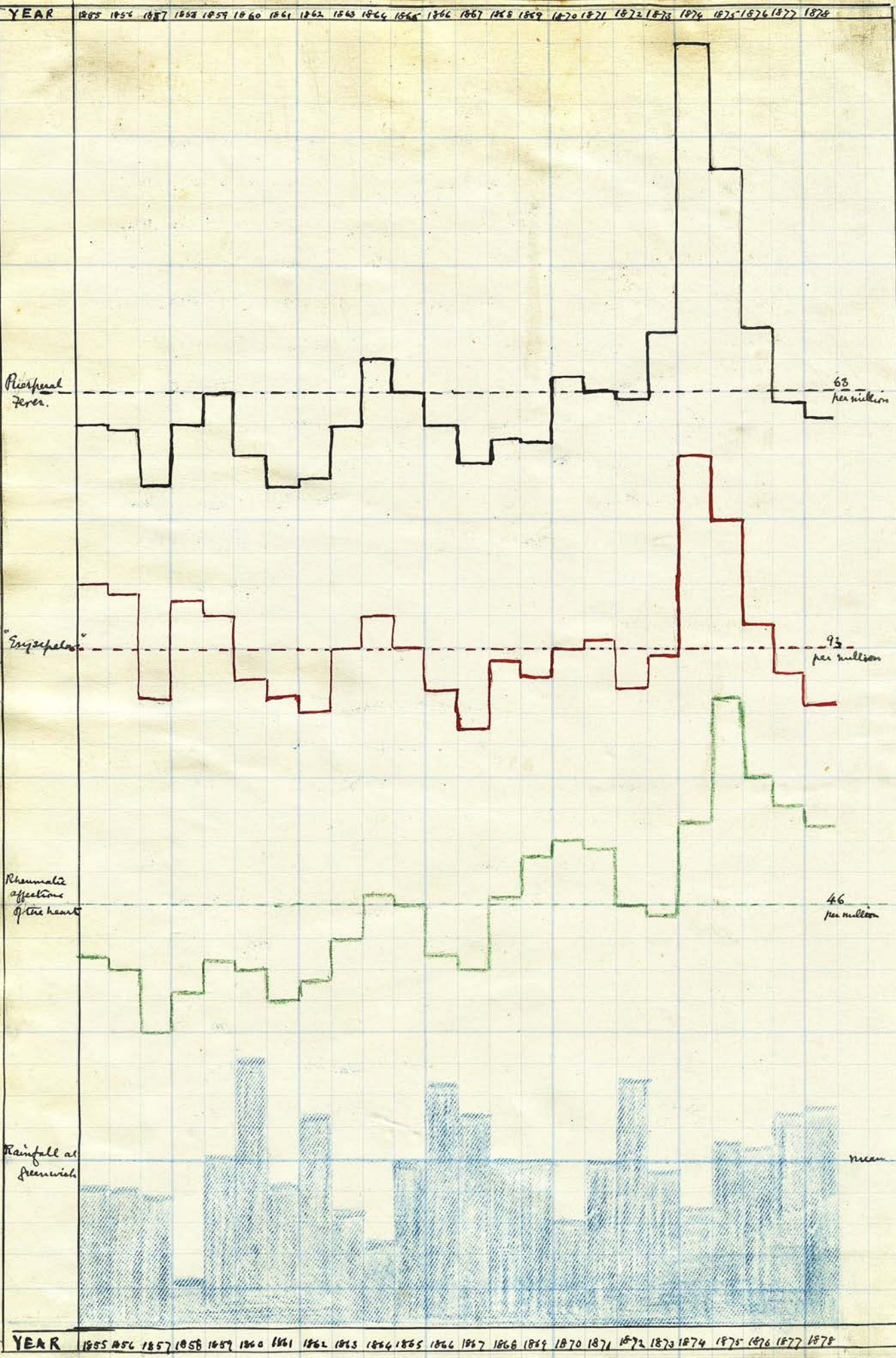
opposite conclusion . The evidence that they prevail together perhaps points to no more than that they flourish under similar conditions.

Not only do their curves of seasonal frequency resemble one another, but their varying mortality in different years rises and falls together in a very striking manner as shown on the chart.

It must be borne in mind that these statistics relate to mortality from all forms of "erysipelas" and that cellullitic affections will probably exert more than a proportionate influence from their greater fatality.

The curves of mortality from "erysipelas" not only resemble that of puerperal fever, but have a very close resemblance to that of rheumatic fever and also in a less degree to pyaemia, as has been shown by Longtail⁵⁵ and Newsholme⁷⁰ ^{stall} this also holds good in Norway. In the Milroy lectures for the present year Dr. Newsholme⁷⁹ emphasises this fact and points out its coincidence with a low rainfall. "The explanation" he says " of the epidemic prevalence of erysipelas and puerperal fever as well as of the rheumatic fever, lay in the favouring influence of a dry and warm subsoil on the specific contagion of the three diseases ".

The minor factors in the propagation of the diseases are also similar, such as overcrowding with the lack of cleanliness and ventilation which it involves.



See previous page

Hirsch's fourth proposition seems to lay itself open to the charge of petitio principii, and it is remarkable that he gives no references in support of it except a statement by Tillmanns⁸⁵ "that it may be taken as proved that many forms of so-called "puerperal fever" are true erysipelas, which has started in lacerations at the entrance of the genital passages." We have also the somewhat ambiguous statement of Spencer Wells⁹⁴ that "the important fact is that erysipelas often attacks the genitals and that the fever accompanying it in the puerperal condition is a very fatal form of the disease classed as puerperal fever".

In a recent paper by Herman⁴¹ he states that he has seen cutaneous erysipelas run its usual course in puerperal patients without producing puerperal fever, even when attacking the labia. He also quotes from Gusev³⁹ cases of erysipelas of the face, (1) present during labour, (2) beginning on the fourth day after labour without any symptoms of puerperal fever, (3) cases of erysipelas occurring along with puerperal fever in which the signs of the latter invariably preceded the former. He considers the opinion that there is a causal connection between them (which he describes as the English view) as without foundation.

Cases of erysipelas in puerpera have also been recorded by Hurry⁴⁸ and Scholefield⁸¹, in the latter

the child was attacked and died, but no mention is made of puerperal fever.

A case similar to the third class of ^{39.}Gusserow's cases, is mentioned by Williams in which a patient suffering from puerperal fever was attacked by erysipelas of the arm appearing the day before her death.

Of some interest in this connection is the case of a young woman who was admitted to the Isolation wards in the fifth month of pregnancy, suffering from septic pneumonia and erysipelas of the face, which supervened after an operation for thrombosis of the lateral sinus connected with middle ear disease. The erysipelas which invaded the whole face ran its usual course and terminated in resolution in seven days and though the temperature before, during and after the attack frequently reached 103°F. abortion did not take place. She ultimately died of exhaustion after removal from the Isolation wards.

In the present state of our knowledge on this point it seems sufficient to admit that puerperal fever and erysipelas prevail together, probably because of natural laws, bearing on the essential causes of these diseases, and not necessarily implying a common origin or at least one can go no further than Volkmann⁹¹ when he says that "when simple erysipelas is abroad there is no doubt that there are sometimes influences at work which generate puerperal fever when women newly delivered are exposed to them".

(2) To Certain Tumours. etc.

Another relation of erysipelas of great interest is the influence which it appears to have in causing the disappearance, or aiding the healing of certain chronic lesions. The chief affections in which benefit has been described are certain tumours notably sarcoma, carcinoma and keloid, certain tubercular affections including lupus, some of the manifestations of syphilis and chronic ulcers and trachoma.

It is stated by Fehleisen³⁰ that these beneficial effects or some of them have been observed as early as the 17th century but such accounts as I have been able to refer to are of much later date. The earlier cases recorded are those in which an inter-current attack of erysipelas took place in the course of some chronic affection, but this has been followed on the continent and in America by the production of erysipelas artificially for its effects as a curative agent.

It has been stated by Professor Hamilton⁴⁰ that it was the beneficial result on an old standing ulcer, which healed after an attack of erysipelas which led Syme to try the method which he so successfully practiced of applying a blister to chronic sores.

Ricord⁷⁵ has also mentioned a case of

extensive phagedenic ulceration which ceased to spread and rapidly improved when attacked by erysipelas, and he is said to have been the first to attempt to produce the disease for its beneficial effects in such cases.

In a case of lympho-sarcoma of the neck under the care of Busch¹² in which erysipelas supervened spontaneously, considerable improvement took place, but the patient died. The tumour is reported by Rindfleisch to have undergone fatty degeneration and was in a state described as a "yellow white emulsion". In a second case of lympho-sarcoma of the neck under the same surgeon the patient was designedly infected with erysipelas by placing her in a bed the occupants of which were frequently attacked with this disease. The tumour was greatly reduced in size but not entirely removed and the remaining portion again enlarged.

Stein¹³ has recorded a case of a large malignant tumour of the breast in which erysipelas followed a hypodermic injection in the back. On the 13th day all that could be discovered of the tumour were two small nodules each the size of a small walnut.

Cazin¹⁴ reports a case of lupus of the fauces and soft palate with tubercular ulceration of both cheeks, in which an attack of erysipelas of the face and throat was followed by rapid improvement

and healing in a few weeks after resisting treatment for several months.

In 1882 Fehleisen³⁰ inoculated seven patients with pure cultures of the streptococcus and in six of them erysipelas was produced. Of these patients three suffered from recurrent carcinoma and two from sarcoma beyond the reach of surgical interference, while the remaining case was one of lupus of the face . The results may be briefly stated thus :- The case of lupus rapidly improved and healed with the exception of a few nodules easily dealt with, in one case of sarcoma there was no improvement while in the other and in all the cases of carcinoma, the tumours were improved for a time and in all some of the nodules disappeared or in one case was emulsified and evacuated . In no malignant tumour was a cure obtained

Among other cases of the beneficial results of erysipelas accidentally acquired Pick⁷⁴ has recorded the absorption of a syphilitic gumma and Muir⁶⁶. the rapid healing of a tubercular ostitis of 14 years duration. A review of the subject with cases has also been given by Bruns⁴⁴.

The largest series of cases treated by erysipelas in one form or other is that published from time to time by Dr. W.B.Coley¹⁶ of the New York cancer hospital. He states that his attention was first directed to this question by observing that a case of sarcoma which had been operated on several



Round-celled sarcoma of neck, cured by erysipelas. Photograph taken seven years after. (Burt's case.)

Photographic reproduction of Coley's original case of Sarcoma
cured by erysipelas (from American Journal Medical Science
May 1893)

times, when accidentally attacked by erysipelas, healed soundly and the patient had remained free from return of the disease although seven years had elapsed. (See photograph)

In his first series of cases, including those of other surgeons, in 17 cases of carcinoma three are stated to have been permanently cured and ten were improved, while one patient died of erysipelas. Of 17 sarcomata seven were cured and had remained free from recurrence for periods of one to seven years, one died of erysipelas, the others showed improvement, the tumour often disappearing and only returning after several months.

These figures include both cases of accidental erysipelas and others in which the result was obtained by the direct inoculation of the streptococcus from culture but in 1894 this method was abandoned in favour of the injections of the toxins, the culture being filtered so as to remove the organisms.

The advantages of this modification are the greater control over the treatment, thus avoiding the danger of erysipelas, and the avoidance of the necessity for isolation. The toxins of bacillus prodigiosus were also used along with those of streptococcus erysipelatosus.

A case of extensive spindle-celled sarcoma of the palate successfully treated by these toxins

is reported by Johnston.⁵⁷

Injectons of 15 minims increased gradually to 60 minims of a filtered bouillon culture of erysipelas were given in the arms and legs of the patient. After a dose of 35 minims of erysipelas toxin was attained, 5 minim doses of B. prodigiosus ^{toxin} were added. The patient was able to swallow freely in a fortnight and improvement was continuous, the treatment being continued for eight months.

Coley⁵⁸ has still further improved his methods of treatment by growing the two organisms together instead of separately and substituting sterilization by heat for filtration. Further successful cases are recorded by this method and in a recent paper in the New York Medical Record for Jan. 19. 1895 his methods and results are given in more detail than in other notices from which I have quoted.

The peptonized bouillon is sterilized in flasks of 50-100 c. c. capacity and then inoculated with the organisms of erysipelas which is incubated for three weeks at 30-35°C. The culture is then inoculated with B. prodigiosus and grown for ten to twelve days more at the temperature of the room. It is then well shaken and decanted into half ounce stoppered bottles and then sterilized by a temperature of 50- 60°C. continued for an hour, which kills the organisms without injuring the toxins. A little powdered thymol is then added for

preservative purposes and the fluid can be used as required and if too strong may be diluted with glycerine or sterile water .

The virulence of the organisms requires to be maintained by the occasional inoculation of rabbits and the recultivation from the affected animal. The cases treated in this manner by mixed toxins up till May 1894 comprised 25 of sarcoma and 8 of carcinoma, while in three the nature of the tumour was not ascertained . In the cases of carcinoma (which were all recurrent) improvement took place but no complete recovery, but in the cases of sarcoma the results were better, six being apparently cured. Details of cases treated by Dr. Coley and others are given in the paper mentioned above.

A case of intra-abdominal tumour treated by erysipelas toxin has lately been recorded by Mynter.⁶⁸ Abdominal section was practiced for a large tumour in a girl 12 years of age, when it was found to involve the peritoneum and pelvic organs in such a way as to be beyond removal. A portion was removed for examination and a large drainage tube inserted. The diagnosis of sarcoma being confirmed, injections of filtered toxin (erysipelas only) in the thigh were begun four days after operation and much fluid and pieces of necrotic tissue "as large as an oyster" were discharged by the drainage tube till in three months the tumour was gone and the

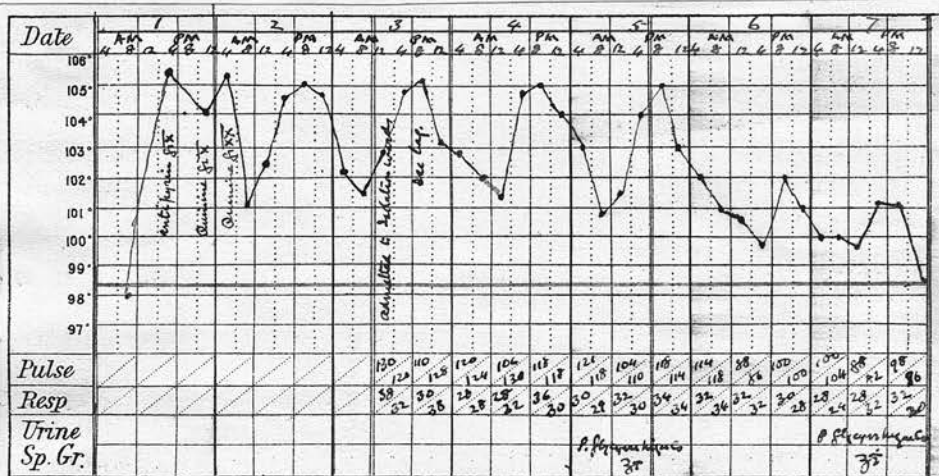
the patient well.

Emmerich²⁸^{has} sought to utilize the beneficial effects of erysipelas in another direction by the preparation of the filtered serum of sheep inoculated with cultures of the streptococcus. Partly from experimental , partly from clinical evidence, he reports favourably of the serum thus obtained as a therapeutic agent in the treatment of lupus tuberculosis , syphilis, malignant disease and diphtheria.

These beneficial results do not seem to be constant and perhaps their permanency admits of doubt.

In a case of lupus of the face, recorded by Dr. Byrom Bramwell⁹ in which three attacks of erysipelas occurred all within the hospital, during the first and second of these there was apparent improvement of the lupus but of very short duration and it was followed by rapid extension of the disease .

During my tenure of office in the Isolation wards, I have had twice an opportunity of observing the occurrence of erysipelas in cases of lupus of the face. In one, the attack of erysipelas was so slight as to be almost of doubtful character, the local redness beginning at the angle of the eye and never exceeding the size of a penny piece. It therefore never extended to the parts where the lupus was most active (about the neck and jaw) and no change was detected in that disease.



Portion of chart Encephalitis occurring in a patient suffering from Lupus of face
 Severe ~~some~~ attack of Encephalitis lasting 9 days Male ad-19.

The second case was one of lupus of the nose and mouth, and erysipelas supervened on the removal of a sebaceous cyst from the forehead. The erysipelas proved one of the most severe cases I have seen, the temperature reaching 105°F. on five successive days, while the oedema of the eyelids was such that the conjunctiva could not be properly exposed for about the same period. The lips and parts affected with lupus were greatly swollen and the wound in the forehead discharged a large quantity of sero-purulent fluid. During desquamation the crusts from the parts affected by lupus were shed and with the disappearance of the oedema, ~~the~~ countenance assumed a much less repulsive appearance. As however the erysipelas was well developed on admission, I was quite unable to form an opinion as to any change in his condition and on enquiring of those who had seen him previously, it seemed that there was at least no marked improvement in the appearance of the lupus. His subsequent history I have been unfortunately unable to obtain.

It is evident that a single, though severe attack, cannot be compared with treatment deliberately carried out during a considerable period of time, but so far as I am aware neither ^{the} streptococcus of erysipelas nor its products have been employed as curative agents in this country.

The results cannot be regarded as decisive

though Coley says inoculation must now be regarded as a recognized method of treatment, its adoption will probably be limited by various circumstances. The greatest measure of success seems to have been obtained in cases of lupus and tubercular lesions, while sarcomata seem considerably more amenable to this treatment than carcinomata. It is probable that in lupus and tubercle we have in tuberculin or its derivatives an agent of somewhat similar character, and with a more definite specific effect in these diseases, while the recent success of cases treated with thyroid makes such an agent less indispensable.

With regard to malignant tumours its effects do not seem sufficiently constant to supersede the knife in such as are accessible to ordinary surgical treatment, but where this is difficult or impossible of attainment, especially if the disease be sarcoma or in cases where recurrence of sarcoma or cancer of the epithelial type has taken place, such treatment might find an application and would I believe be justified even as a dernier resort in such cases of malignant disease as are at present beyond reach of cure.

CHAPTER VII.

CONCLUSION.

The examination of the history and literature of this subject, together with such acquaintance with its clinical features as the treatment of some fifty cases of various degrees of severity has enabled me to acquire , seem to warrant the following conclusions:--

That the term "erysipelas" as at present used in this country is indefinite in so far that it is applied to various classes of cases differing widely in severity.

That as employed by many , it covers more than a single disease, there being both clinical and pathological evidence that simple erysipelas differs from cellulitis not in degree but in nature .

That therefore it is desirable that the differences between these affections be more emphasized than at present, as in addition to the inevitable confusion arising from two conditions being known by the same name, difficulties arise in the certification of deaths, notification of

infectious diseases and similar occasions , with the result that official returns as to erysipelas are of very uncertain value.

That as simple erysipelas runs a tolerably regular course with definite symptoms , to it alone should the name erysipelas be applied; the destructive inflammatory affections of the deeper structures being provisionally grouped together as cellulitis, though probably representing more than one disease .

That there is reason to believe that erysipelas may attack the throat either primarily or by extension from the cutaneous surface, but its occurrence on other mucous surfaces is more doubtful, and affections of internal organs thus described are probably of a different nature.

That the epidemic erysipelas of North America cannot be regarded as ordinary erysipelas and was probably of a different nature.

That the destructive process sometimes called erysipelas of the vulva is essentially a different disease.

That erysipelas is due to an organism first isolated by Fehleisen, the streptococcus erysipelatosus and there is reason to believe that this organism is specific for the disease and distinct from streptococcus pyogenes though perhaps at times associated with it.

That this organism is probably widely diffused outside the body and its multiplication is governed by meteorological conditions as yet ~~im~~perfectly understood, but probably favoured by warmth and dryness of the subsoil.

That probably in all cases the infection takes place by way of some breach of surface (which may restrict the diffusion of the disease among the population at large) but that the association with a previous case is not necessary for the spread of the disease.

That the infective power of erysipelas is very slight and can only act at short distances.

That epidemics have usually taken place in hospitals, and have been probably due to the direct transference of the virus by the hands or instruments of attendants.

That with the adoption of antiseptic precautions such transference is very little to be dreaded, probably much less so than many affections of a cellulitic nature which are not isolated.

That there is probably no drug which has a specific action on erysipelas and therefore the disease being an extremely depressing one and of variable duration, stimulants , chiefly in the form of alcohol are in most cases indicated from the outset.

That they should be given in moderate quantity frequently repeated and increased if necessary, the more powerful cardiac tonics being held in reserve for special cases and emergencies.

That the patient should be kept warm and supplied with abundant liquid nourishment, but with the exception of attention to the state of the stomach and bowels, drugs should be avoided where possible.

That locally the application of iodine according to the method described by Miles will probably arrest the disease and that in this direction lies the greatest hope of shortening the patient's illness.

That in patients thus treated the disease
is not a serious one, and does not usually last
above a week and recovery may be expected in the
 great majority of cases, the mortality probably not
exceeding 5 per cent.

That the popular dread of erysipelas is due
largely to the confusion between this disease and
cellulitis .

That puerperal fever has probably no connec-
tion with erysipelas beyond its coincidence in time
 and place and the fact that it has frequently been
 traced to cases of cellulitis described under that
 name.

That while the mass of evidence in favour of
 the beneficial effects of erysipelas on lupus,
tumours etc is undoubted , the desirability of in-
 ducing the disease for curative purposes is open to
 question.

That the application of this curative influ-
ence should probably be reserved for cases beyond
the scope of operative interference and in these
 it deserves further trial, the most suitable method
at present known being the injection of the toxin
in the form of "killed cultures".

CHAPTER VIII.

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